POLICE MODIFIER GUIDE

WHAT'S NEW

What's New

MECHANICAL
- New/Changed
- H8 AGM Battery (Standard; 850 CCA/92-amp)
- Manual Police Pursuit Mode (Steering Wheel Switch Execution)

EXTERIOR
New/Changed
- Tail Lamp Prep Kit

INTERIOR/COMFORT
- Climate Control – Rear Aux A/C System
- Dark Car
- Red and White Dome Lamp in Cargo Area
- Speedometer – New LCD 12.3» Display

FUNCTIONAL
- 100 Watt Siren/Speaker Prep Kit
- Vehicle Integration System 2.0
- PAITRO output tied to liftgate release switch
- Police Engine Idle
- Keyless Entry – Key FOB Only (Less PATS)

SAFETY/SECURITY
- BLIS® – Blind Spot Monitoring with Cross-traffic Alert
- Cross Traffic Brake Assist
- Police Perimeter Alert detects motion in an approximately 270-degree radius on sides and back of vehicle
- Rearview Camera viewable on 8" Center Stack Screen

For more information on Features and Options, refer to the Brochure:
https://www.ford.com/police-vehicles/

POLICE MODIFIER GUIDE

TABLE OF CONTENTS

SECTION 1 – General Information
- Important Safety Notice 5
- Police Vehicle Definition 5
- Good Practices 6
- New Vehicle Storage 6
- Tires and Loading 6
- Ambient Temperature Change and Tire Pressure 8
- Ride Height Measurement — Front 9
- Ride Height Measurement — Rear 9
- Ride Height Specifications 10

SECTION 2 – Electrical Information
- Electrical Basics 11
- Control Modules — Red Area 11
- Controller Area Network (CAN) Bus 11
- General Guidelines For Vehicle Modification 11
- Auxiliary Power Point — 12V 12
- DC/DC Converter 13
- Vehicle Component Electrical Loads 13
- Police Interceptor Utility Hybrid— Rear Power Access 13
- Access to Signals and Power 14
- Wig Wag 15
- Steering Wheel Switch Output 19
- Police Accessory Independent Time Release 19
- Equipment Grounding Guidelines 19
- Wire Insulation 19
- Terminal & Connectors 19
- Wire Protection Requirements 20
- Replacing Ford OEM Antenna To An Aftermarket Antenna 21
- Wire Routing & Retention 21
- Wire Splices & Repairs 21
- Grommets and Sealing Requirements 24
- Rear Spoiler Removal And Installation 25
- Vehicle Decommissioning 26
- Equipment Groups 27
- Key Exterior Options 35
- Wire Diagrams 50
- Ford Pro vehicle Integration System 2.0 67
- High Voltage Depowering 70

SECTION 3 – Installation Considerations
- Push Bumpers 73
- Vehicle Interior Partition Installation Guidelines 73
- Seatbelt Operation 74
- Siren & Grill Lights 74
- Mounting Equipment Considerations 74
- Airbag, Safety Restraint System And Side Impact Sensor Component Description And Location 74
- Airbag Deployment Interference 76
- Front Seat Headrest 76
- Seat Attachment Bolts 77
- Roof Bow Locations 78
- Areas To Avoid – Mounting Locations 79
- Floor Drain 80

SECTION 4 – Airbag Deployment Interference Zones
- Airbag Deployment Interference Zones 82

SECTION 5 – Reference Information
- Vehicle Camera and Rader 'Field Of View' 86
- Ballistic Panel Replacement 87
  - Door Disassembly
  - Panel Preparation
  - Door Reassembly

SECTION 6 – Change Control 34

POLICE MODIFIER GUIDE

SECTION 1 – INTRODUCTION

INTRODUCTION

Ford Motor Company has assembled this guide to assist vehicle modifiers in producing a safe and quality vehicle. Ford believes safety and quality come first. To achieve customer satisfaction, we want to assist modifiers in achieving the highest standards of safety and quality in their vehicles.

This book is divided into topics pertinent to vehicle modifiers. References are made to the Workshop Manual (Ford Motorcraft https://www.motorcraftservice.com/) for appropriate service procedures, torque specifications, component separation clearances and other standard information which is common with an unmodified vehicle. Specifications unique to this guide are designated.

This modifier guide is not a “how-to” book; it should be used as a checklist to help make sure that certain important steps in the modification process are considered. It is ultimately the responsibility of the upfitter with knowledge of the entire upfit to ensure the checklist is complete. While Ford is providing this information to assist modifiers, it does not warrant the vehicles, methods, materials, or the workmanship of the modifier. Ford also does not warrant against failures that result from the modification of a vehicle.

Following the guidelines contained in this guide does not assure individual modifiers that the products they modify comply with US Federal or Canadian Motor Vehicle Safety Standards in effect at the time of the modification. The guidelines set forth are based on engineering analysis of typical vehicles. If the guidelines are followed, the modifier’s efforts in certifying vehicles to applicable standards should be aided.

Compliance testing that may be required for certification of specific vehicle configurations or construction is the sole responsibility of the individual modifier.
The only model suitable for use in police service is the pursuit-rated Police Interceptor. DuPont™ and KEVLAR® are trademarks or registered trademarks of DuPont™ or its affiliates.

GENUINE FORD ACCESSORIES FOR YOUR VEHICLE

A wide selection of genuine Ford accessories are available for your vehicle through your local authorized Ford or Ford of Canada dealer.
These quality accessories have been specifically engineered to fulfill your automotive needs; they are custom designed to complement the style and aerodynamic appearance of your vehicle. In addition, each accessory is made from high-quality materials that meet or exceed Ford's rigorous engineering and safety specifications. Ford Motor Company will repair or replace any properly installed genuine Ford accessory found to be defective in factory-supplied materials or workmanship during the warranty period, as well as any component damaged by the defective accessory. The accessory will be warranted for whichever provides you the greatest benefit:

- 12 months or 20,000 km (12,000 mi), whichever occurs first; or
- the remainder of your new vehicle limited warranty.

This means that genuine Ford accessories purchased along with your new vehicle and installed by the dealer are covered for the full length of your new vehicle's limited warranty — 3 years or 60,000 km (36,000 mi), whichever occurs first. Contact your dealer for details and a copy of the warranty.

CONSIDERATIONS WHEN USING OR INSTALLING ACCESSORIES

For maximum vehicle performance, keep the following information in mind when adding accessories or equipment to your vehicle:

- When adding accessories, equipment, passengers and/or luggage to your vehicle, do not exceed the gross vehicle weight rating (GVWR) or gross axle weight rating (GAWR) as indicated on the Safety Compliance Certification Label. Consult your dealer for specific weight information.
- The Federal Communications Commission (FCC) and Canadian Radio Telecommunications Commission (CRTC) regulates the use of mobile communication systems, such as 2-way radios, telephones and theft alarms that are equipped with radio transmitters. Any such equipment installed in your vehicle should comply with FCC or CRTC regulations and should only be installed by a qualified service technician.
- Mobile communication systems may harm the operation of your vehicle, particularly if they are not properly designed for automotive use.
- To avoid interference with other vehicle functions, such as the anti-lock brake system (ABS), amateur radio users who install radios and antennas onto their vehicle should not locate the antenna in the area of the driver's side hood.
- Electrical or electronic accessories or components that are added to the vehicle by the dealer or the owner may adversely affect battery performance and durability.

For further technical questions, please contact the Ford Body Builders Advisory Service at the following link: https://www.fordpro.com/en-us/upfit/bbas/ and submit a request.

POLICE MODIFIER GUIDE

SECTION 1 – GENERAL INFORMATION

IMPORTANT SAFETY NOTICE

NOTE: The descriptions and specifications contained in this guide were in effect at the time this guide was approved for printing. Ford Motor Company reserves the right to discontinue models at any time or change specifications or design without notice and without incurring obligation.

Appropriate repair methods and procedures are essential for the safe, reliable operation of all motor vehicles as well as the personal safety of the individual doing the work. This guide provides general direction and guidelines for performing modifications to the vehicle, which will help assure reliability.

There are numerous variations in procedures, techniques, tools and parts for modifying vehicles, as well as in the skill level of the individual doing the work. This guide cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this guide must first establish that they compromise neither their personal safety nor the vehicle integrity by the choice of methods, tools or parts.

WARNINGS, NOTICES and NOTES

As you read through this guide, you will come across WARNINGS, NOTICES and NOTES. Each one is there for a specific purpose.

- WARNINGS remind you to be especially careful in those areas where carelessness can cause your personal injury.
- NOTICES are given to prevent you from making an error that could damage the vehicle or the vehicle's components.
- NOTES give you added information that will help you to complete a particular procedure. The following list contains some generalized warnings that you should follow when working on a vehicle.

WARNING:

- For eye protection, always wear safety glasses.
- Use safety stands whenever a procedure requires you to be under the vehicle.
- Make sure the ignition switch is always in the OFF position, unless otherwise required by the procedure.
- Set the parking brake when working on the vehicle. The gear selector should be set in PARK unless instructed otherwise for a specific operation. Place wood blocks (4-inch x 4 inch or larger) against the front and rear surfaces of the tires to help prevent the vehicle from moving.
- Do not smoke while working on a vehicle.
- To reduce the risk of injury, always remove rings, watches, loose hanging jewelry and loose clothing before working on a vehicle.
- When it is necessary to work under the hood, keep hands and other objects clear of the cooling fan blades.
- Failure to follow these instructions may result in personal injury or death.

NOTICE:

- Do not modify the cooling system. High voltage vehicle components may be damaged if any cooling system modifications are attempted.
- Before placing the vehicle in a paint booth, make sure that the HVTB is not installed in the vehicle. In addition, the Charge Port Light Ring (CPLR) must be covered / protected from heat. High paint booth temperatures may damage the HVTB and the CPLR.
- Remove the service disconnects while carrying out any vehicle modifications.

Making Safety Devices and Elements Inoperative

The vehicle contains many safety features required by US Federal or Canadian Motor Vehicle Safety Standards. These features, which include the key-on-ignition chime and brake lights, should never be disabled or modified.

CFR 49 Section 30122 states that "A manufacturer, distributor, dealer or motor vehicle repair business may not knowingly make inoperative any part of a device or element of design installed on or in a motor vehicle or motor vehicle's equipment in compliance with an applicable motor vehicle safety standard prescribed under this chapter unless the manufacturer, distributor, dealer or repair business reasonably believes the vehicle or equipment will not be used (except for testing or a similar purpose during maintenance or repair) when the device or element is inoperative."

GOOD PRACTICES

Process and Quality Assurance Systems
A formalized Process and Quality Assurance Systems check may be helpful in consistently producing high-quality products. An overview of some of the key items for such a system are outlined in this section.

Quality Assurance
Completed Unit Sign-Off: All control items should be inspected with a written sign-off. All labels should be inspected and signed off, including verification the information on the labels is correct. All appropriate systems should be checked for leaks. A road test should be performed to verify that all systems are operating correctly. All systems and functions that were provided by Ford should be checked to make sure they function correctly after the build process.

The modifier's Process and Quality Assurance Systems should also assure that appropriate training is provided to the employees.

Minimum and Maximum Screw Sizes
When installing aftermarket equipment, avoid using fasteners that are too long for the application or are in an area which might damage vehicle components, including wiring, brake lines, fuel tank and lines, powertrain components, exhaust system and suspension.

POLICE MODIFIER GUIDE

SECTION 1 – GENERAL INFORMATION

IMPORTANT SAFETY NOTICE

NOTE: The descriptions and specifications contained in this guide were in effect at the time this guide was approved for printing. Ford Motor Company reserves the right to discontinue models at any time or change specifications or design without notice and without incurring obligation.

Appropriate repair methods and procedures are essential for the safe, reliable operation of all motor vehicles as well as the personal safety of the individual doing the work. This guide provides general direction and guidelines for performing modifications to the vehicle, which will help assure reliability.

There are numerous variations in procedures, techniques, tools and parts for modifying vehicles, as well as in the skill level of the individual doing the work. This guide cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this guide must first establish that they compromise neither their personal safety nor the vehicle integrity by the choice of methods, tools or parts.

Warnings, Notices And Notes

As you read through this guide, you will come across WARNINGS, NOTICES and NOTES. Each one is there for a specific purpose.

- WARNINGS remind you to be especially careful in those areas where carelessness can cause you personal injury.
- NOTICES are given to prevent you from making an error that could damage the vehicle or the vehicle's components.
- NOTES give you added information that will help you to complete a particular procedure. The following list contains some generalized warnings that you should follow when working on a vehicle.

WARNING:

- The nominal High Voltage Traction Battery (HVTB) voltage is approximately 300 volts DC. The HVTB and charging system contain high voltage components and wiring. High voltage cables and wiring are orange in color. Before carrying out any vehicle modifications, the HVTB must be depowered. Any modification, service, or repairs to the high voltage system or its components, must be done by a trained service technician. Failure to follow these instructions may result in severe personal injury or death.
- For eye protection, always wear safety glasses.
- Use safety stands whenever a procedure requires you to be under the vehicle.
- Make sure the ignition switch is always in the OFF position, unless otherwise required by the procedure.
- Set the parking brake when working on the vehicle. The gear selector should be set in PARK unless instructed otherwise for a specific operation. Place wood blocks (4-inch x 4 inch or larger) against the front and rear surfaces of the tires to help prevent the vehicle from moving.
- Do not smoke while working on a vehicle.
- To reduce the risk of injury, always remove rings, watches, loose hanging jewelry and loose clothing before working on a vehicle.
- When it is necessary to work under the hood, keep hands and other objects clear of the cooling fan blades.
- Failure to follow these instructions may result in personal injury or death.

NOTICE:

- Do not modify the cooling system. High voltage vehicle components may be damaged if any cooling system modifications are attempted.
- Before placing the vehicle in a paint booth, make sure that the HVTB is not installed in the vehicle. In addition, the Charge Port Light Ring (CPLR) must be covered / protected from heat. High paint booth temperatures may damage the HVTB and the CPLR.
- Remove the service disconnects while carrying out any vehicle modifications.

Making Safety Devices and Elements Inoperative

The vehicle contains many safety features required by US Federal or Canadian Motor Vehicle Safety Standards. These features, which include the key-on-ignition chime and brake lights, should never be disabled, or modified.

CFR 49 Section 30122 states that "A manufacturer, distributor, dealer or motor vehicle repair business may not knowingly make inoperative any part of a device or element of design installed on or in a motor vehicle or motor vehicle's equipment in compliance with an applicable motor vehicle safety standard prescribed under this chapter unless the manufacturer, distributor, dealer or repair business reasonably believes the vehicle or equipment will not be used (except for testing or a similar purpose during maintenance or repair) when the device or element is inoperative."

POLICE VEHICLE DEFINITION

The Police Interceptor vehicle is put through twice as many cycles of Ford's standard vehicle durability tests to make sure it meets the rigors of police usage. This vehicle testing is in addition to substantial component durability testing. This extra testing for the Police Interceptor certifies to Ford the entire vehicle is "heavy-duty" and suitable for police usage.

For standard features and options please refer to https://www.ford.com/police-vehicles/

POLICE MODIFIER GUIDE

SECTION 1 – GENERAL INFORMATION

GOOD PRACTICES

Process and Quality Assurance Systems
A formalized Process and Quality Assurance Systems check may be helpful in consistently producing high-quality products. An overview of some of the key items for such a system are outlined in this section.

Quality Assurance

Completed unit sign-off: All control items should be inspected with a written sign-off. All labels should be inspected and signed off, including verification that the information on the labels is correct. All appropriate systems should be checked for leaks. A road test should be performed to verify that all systems are operating correctly. All systems and functions that were provided by Ford should be checked to make sure that they function correctly after the build process.
The modifier's Process and Quality Assurance Systems should also make sure that appropriate training is provided to the employees.

Minimum and Maximum Screw Sizes
When installing aftermarket equipment, avoid using fasteners that are too long for the application or are in an area which might damage vehicle components, including the low voltage wiring, the high voltage system including the HVTB and the (orange) high voltage wiring/cables, brake lines, fuel tank and lines, powertrain components, exhaust system or suspension.

NEW VEHICLE STORAGE

New Vehicle Storage — General

- Vehicle should be stored in a dry, ventilated place, and protected from sunlight, if possible.
- If vehicle is stored outside, maintenance against rust and damage, as described below, is recommended.

NOTICE: Keep all rubber parts free from oil and solvents.

New Vehicle Storage — Body

- Wash vehicle thoroughly to remove dirt, grease, oil, tar or mud from exterior surfaces and underside of front fender.
- Periodically wash if vehicle is stored in exposed locations.
- Touch up exposed raw or primed metal to provide rust protection.
- Cover chrome and stainless-steel parts with a thick coat of auto wax to prevent discoloration. Rewax as necessary when the vehicle is washed.
- Lubricate all hood, door hinges and latches with a light grade oil.
- Cover the interior soft trim to prevent fading.

New Vehicle Storage — Engine

Start the engine every 15 days. Run it at fast idle until it reaches normal operating temperature.
With foot on brake pedal (and brake applied), shift the transmission into all gears while the engine is running.

New Vehicle Storage — Fuel System

Regularly move vehicle short distances to mix fuel anti-oxidation agents.

NOTE: During extended periods of vehicle storage (60 days or more), gasoline may deteriorate due to oxidation. This can damage rubber and other polymers in the fuel system and may clog small orifices. A commercially available gasoline fuel stabilizer (Sta-Bil or equivalent) should be added to gasoline-powered vehicles whenever actual or expected storage periods exceed 60 days. The manufacturer's instructions packaged with the product should be followed. The vehicle should then be operated at an idle speed to circulate the additive throughout the fuel system.

New Vehicle Storage — Tires

Most high-performance tires are made with nylon overlay. As such, the following steps should be taken to avoid flat spotting when the vehicle is not used for a period of time.

- Keep the vehicles tire pressure at the recommended operating pressure.
- If the vehicle is stored for a period longer than 15 days, it should be moved several feet during each 15-day period. The vehicle should be parked after being moved so that a different portion of the tread contacts the ground.

Vehicle Storage — Electrical

NOTICE: If your vehicle is to be stored for 30 days or longer, the low voltage (underhood) battery negative terminal must be disconnected. Failure to do this could damage the vehicle's battery.

NOTE: Extended storage time which results in the discharge of the low and/or high voltage batteries, may result in the setting of Diagnostic Trouble Codes (DTCs) and/or a no-start condition.

To maintain the high voltage battery charge, once a month your vehicle’s high voltage battery should be charged. This will maintain the high voltage battery but may not be enough to maintain the low voltage (underhood) battery and additional low voltage (underhood) battery charging may be required after 60 days.

TIRES AND LOADING

Tire Replacement Requirements
WARNING: Only use replacement tires and wheels that are the same size and type (such as P-metric versus LT-metric or all-season versus all- terrain) as those originally provided by Ford. Use of any tire or wheel not recommended by Ford can affect the safety and performance of your vehicle, which could result in an increased risk of the loss of vehicle control, vehicle rollover, personal injury or death. Additionally, the use of non-recommended tires and wheels could cause steering or suspension failure. If you have questions regarding tire replacement, see an authorized Ford or Lincoln dealer.

TIRES AND LOADING *(Cont'd)*

NOTICE: Do not install an off road, aggressive tread or incorrectly sized tire. Any of these may cause elevated stress to the steering system. This can cause the power steering system to overheat and shut off the power assist, which can affect the safety and performance of your vehicle.

NOTE: Vehicles are equipped with a reduced rolling resistance tire design. The use of a different tire can affect the travel distance of the vehicle as well as the vehicle's fuel economy.

Make sure all tires and wheels on the vehicle are of the same size, type, tread design, brand, load-carrying capacity and speed rating because it can affect the safety and performance of your vehicle, which could result in an increased risk of loss of vehicle control.

Tire Pressure Monitoring System (TPMS) Principles of Operation

The TPMS monitors the tire pressure using 4 valve stem mounted TPMS sensors to provide accurate tire pressures. Each individual sensor contains its own battery and transmits tire pressure data to the controlling module every 60 seconds when the vehicle speed exceeds 32 km/h (20 mph). The TPM module is a radio receiver that collects the tire pressure data and relays the information via the MS-CAN to the BCM. All of the TPMS functions are controlled by the BCM. The TPMS sensors are trained to the BCM, which records each TPMS sensors unique identifier. The BCM records where each TPMS sensor is located based on the training order and compares the actual tire pressure with the desired tire pressure as indicated on the Vehicle Certification label. If the tire pressure deviates from the desired tire pressure the BCM, using the HS-CAN, signals the IPC to illuminate the TPMS warning indicator and also displays a message on the message center. The programmed tire pressure cannot be changed.

This vehicle, as delivered by Ford Motor Company, conforms to Standard FMVSS138, Tire Pressure Monitoring Systems. This system may not function if any of the following components are removed, relocated or modified in anyway:

- Original Equipment Manufacturer (OEM) wheels and tires
- Tire pressure sensors or valve stems
- Body Control Module (BCM)
- Body Control Module (BCM) software and calibrations
- Tire Pressure Module (TPM)
- Instrument Cluster (IC) module
- Instrument Cluster (IC) software and calibrations
- Vehicle wheelbase longer than originally released.

Certain modification could cause reduced system performance, up to and including the complete loss of TPMS functionality. This may include:

- Non-OEM wheels or tires
- The addition of steel carcass or run-flat tires.
- Modification of the vehicle's recommended tire pressure
- Lengthening of the vehicle's wheelbase may affect signal strength of the sensors to a point where the rear sensors can no longer be heard by the TPM module. (Vehicles certified at released wheelbases only)
- The addition of metallic structures, such as prisoner partitions, may affect the signal strength of the sensors and could interfere or prevent the TPM module from hearing the rear sensors.
- The addition of intended or unintended transmitters to the vehicle may affect the signal strength of the sensors or interfere with the TPM module's antenna.

The TPMS, as delivered from the Ford Motor Company, complies with part 15 of the FCC rules and with RS-210 of Industry Canada. Operation is subject to the following 2 conditions:
This device may not cause harmful interference, and
This device must accept any interference received, including interference that may cause undesired operation.

Using Snow Tires and Traction Devices

NOTE: Snow tires must be the same size and grade as originally equipped on your vehicle.

The tires on your vehicle have all-weather tread to provide traction in the rain and snow; however, in some climates, using snow tires or traction devices may be necessary.

Follow these guidelines when using snow tires and traction devices:

- SAE Class "S" cables should ONLY be used on the vehicle front tires.
- Install cables or chains securely, verifying that the cables or chains do not touch any wiring or brake lines.
- Drive cautiously! If you hear the cables or chains rub or bang against the vehicle, stop and retighten them. If this does not work, remove the cables or chains to prevent vehicle damage.
- Avoid overloading your vehicle.
- Remove the cables or chains when they are no longer needed. Do not use cables or chains on dry roads.
- Do not exceed 48 km/h (30 mph) with tire cables or chains on your vehicle.

Consult your dealer for information on other Ford approved methods of traction control.

Vehicle Loading

WARNING: The appropriate loading capacity of your vehicle can be limited either by volume capacity (how much space is available) or by payload capacity (how much weight the vehicle should carry). Once you have reached the maximum payload of your vehicle, do not add more cargo, even if there is space available. Overloading or improperly loading your vehicle can contribute to the loss of vehicle control and vehicle rollover.
WARNING: Exceeding the Safety Compliance Certification Label axle and/or vehicle weight rating limits could result in substandard vehicle handling or performance, engine, transmission and/or structural damage, serious damage to the vehicle, loss of control and personal injury.

Vehicle Loading *(Cont'd)*

Gross vehicle weight rating (GVWR) is the maximum allowable weight of the fully loaded vehicle (including all options, equipment, passengers and cargo). The GVWR is shown on the Safety Compliance Certification Label located on the B-pillar or the edge of the driver's door.

Gross axle weight rating (GAWR) is the maximum allowable weight that can be carried by a single axle (front or rear). These numbers are shown on the Safety Compliance Certification Label located on the B-pillar or the edge of the driver's door. The total load on each axle must never exceed its GAWR.

WARNING: Do not use replacement tires with lower load carrying capacities than the original tires because they may lower the vehicle's gross vehicle weight rating (GVWR) and gross axle weight rating (GAWR) limitations. Replacement tires with a higher limit than the originals do not increase the GVWR and GAWR limitations.

Steps for determining the correct load limit:

- Locate the statement "The combined weight of occupants and cargo should never exceed XXX kg or XXX lb." on your vehicle's placard.
- Determine the combined weight of the driver and passengers that will be riding in your vehicle.
- Subtract the combined weight of the driver and passengers from XXX kg or XXX lb.
- The resulting figure equals the available amount of cargo and luggage load capacity. For example, if the "XXX" amount equals 1,400 lb. and there will be five 150 lb. passengers in your vehicle, the amount of available cargo and luggage load capacity is 650 lb. (1400 - 750 (5 x 150) = 650 lb.). In metric units (635 - 340 (5 x 68) = 295 kg).
- Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage load capacity calculated in the step above.

AMBIENT TEMPERATURE CHANGE AND TIRE PRESSURE

NOTICE: Do not inflate tire higher than maximum pressure stamped on tire sidewall. Premature tire wear or damage to the tire may result.

Tire pressures fluctuate with temperature changes. For this reason, tire pressure must be set to specification when tires are at outdoor ambient temperatures. If the vehicle is allowed to warm up to shop temperatures, and the outside temperature is less than shop temperature, the tire inflation pressure must be adjusted accordingly.

If the tires are inflated to specification at shop temperatures, and the vehicle is moved outdoors when the outdoor ambient temperature is significantly lower, the tire pressure may drop enough to be detected by the TPMS and activate the TPMS warning lamp.

As the ambient temperature decreases by 6°C (10°F), tire pressure decreases 7 kPa (1 psi). Adjust the tire pressure by 7 kPa (1 psi) for each 6°C (10°F) ambient temperature drop as necessary to keep the tire at the specified vehicle certification label pressure. Refer to the following tables to adjust the tire pressure indoors for colder outside temperatures.

Table 1. Use Table to Adjust Tire Pressure Inside Garage for Colder Outside Temperature[1]
** Do Not Inflate Tire Higher than Maximum Pressure Stamped on Tire Sidewall. **

Table is based on a Garage Temperature of 70˚F. Max Pressure Adjustment is 7 psi.

Outside Temperature (˚F)	Tire Placard Pressure (PSI)																	
	30	32	34	35	38	40	41	42	45	50	55	60	65	70	75	80	85	90
70	30	32	34	35	38	40	41	42	45	50	55	60	65	70	75	80	85	90
60	31	33	35	36	39	41	42	43	46	51	56	61	67	72	77	82	87	92
50	32	34	36	37	40	42	43	44	47	53	58	63	68	73	79	84	89	94
40	33	35	37	38	41	43	44	45	49	54	59	64	70	75	80	86	91	96
30	34	36	38	39	42	44	46	47	50	55	61	66	72	77	82	87	92	97
20	35	37	39	40	43	46	47	48	51	57	62	67	72	77	82	87	92	97
10	36	38	40	41	45	47	48	49	52	57	62	67	72	77	82	87	92	97
0	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-10	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-20	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-30	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-40	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97

Table 2. Use Table to Adjust Tire Pressure Inside Garage for Colder Outside Temperature (Metric Units)[1]
** Do Not Inflate Tire Higher than Maximum Pressure Stamped on Tire Sidewall. **

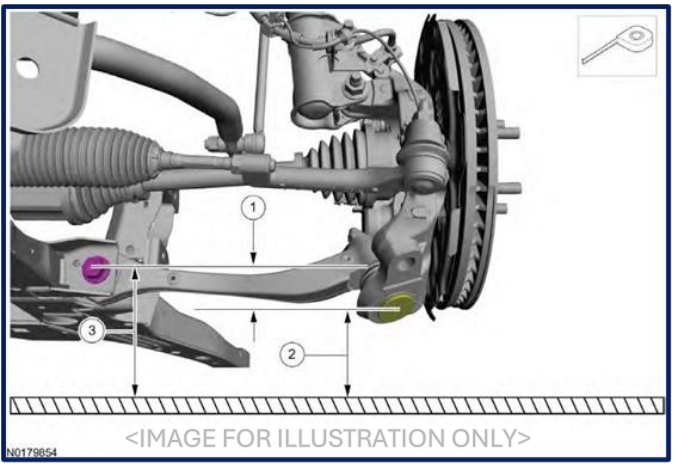
Table is based on a Garage Temperature of 21˚C. Max Pressure Adjustment is 50 kPa.

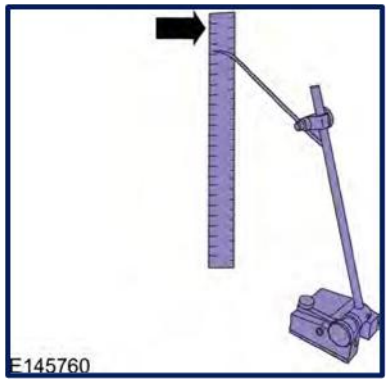
Outside Temperature (˚C)	Tire Placard Pressure (kPa)																	
	205	220	235	240	260	275	285	290	310	345	380	415	450	485	515	550	585	620
21	205	220	235	240	260	275	285	290	310	345	380	415	450	485	515	550	585	620
16	215	230	240	250	270	285	290	295	315	350	385	420	460	495	530	565	600	635
10	220	235	250	255	275	290	295	305	325	365	400	435	470	505	545	580	615	650
4	230	240	255	260	285	295	305	310	340	370	405	440	485	515	550	595	625	660
-1	235	250	260	270	290	305	315	325	345	380	420	455	495	530	565	600	635	670
-7	240	255	270	275	295	315	325	330	350	395	425	460	495	530	565	600	635	670
-12	250	260	275	285	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-18	255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-23	255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-29	255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-34	255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-40	255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670

[1]When Outside (Ambient) Temperature is greater than 21˚C (70˚F), Inflate tires to placard pressure.
[1]Use the table to adjust tire pressure for P-metric and LT tires only.

N0072166

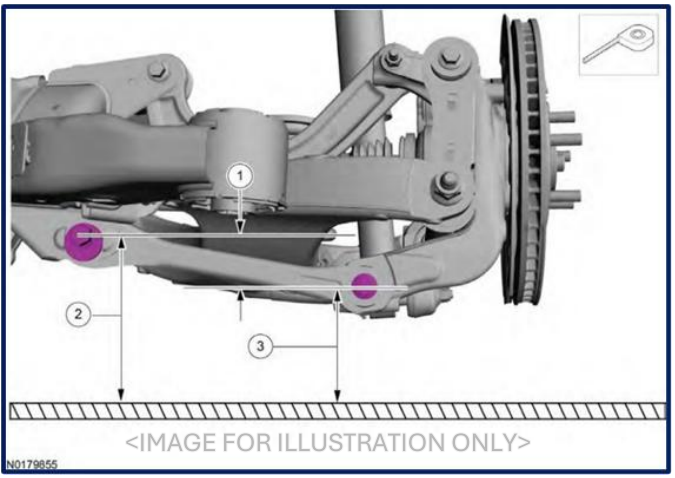
RIDE HEIGHT MEASUREMENT — FRONT





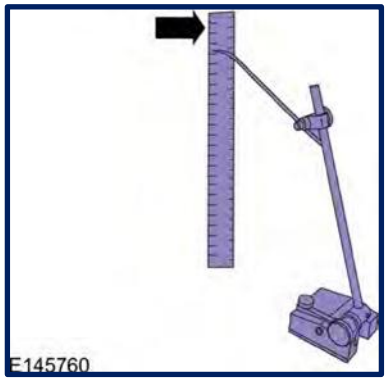
1. NOTE: Make sure that the vehicle is positioned on a flat, level surface. Jounce front and rear suspension vigorously to allow the vehicle to settle.
2. Before measuring ride height check:
   a. Tires are inflated to the correct pressure.
   b. Vehicle should have at least one-half tank of fuel.
   c. All fluids at proper levels.
   d. No cargo inside the cab or bed.
   e. Inspect for aftermarket equipment. Check for aftermarket changes to the steering, suspension, wheel and tire components (such as competition, heavy duty, etc.).
3. Ride height = 3–2 (Use the General Equipment: Surface Gauge)
   - Measure the distance between the flat level surface and the center of the rear control arm ball joint cap. (measurement 2)
   - Measure the distance between the flat level surface and the center of the rear control arm inboard bolt. (measurement 3)
4. With the surface gauge positioned on a flat, level surface, record the measurement of the surface gauge position (measurement 2) and (measurement 3).
5. Subtract measurement 2 from measurement 3 to obtain the front ride height.

RIDE HEIGHT MEASUREMENT — REAR



1. NOTE: Make sure that the vehicle is positioned on a flat, level surface, transmission in the PARK position and the parking brake OFF.
2. Jounce front and rear suspension vigorously to allow the vehicle to settle.
   a. Before measuring ride height check:
   b. Tires are inflated to the correct pressure.
   c. Vehicle should have at least one-half tank of fuel.
   d. All fluids at proper levels.
   e. No cargo inside the cab or bed.
   f. Inspect for aftermarket equipment. Check for aftermarket changes to the steering, suspension, wheel and tire components (such as competition, heavy duty, etc.).
3. Ride height = 2–3 (Use the General Equipment: Surface Gauge)
   - Measure the distance between the flat level surface and the center of the toe link inboard cam bolt. (measurement 2)
   - Measure the distance between the flat level surface and the center of the toe link outboard bolt. (measurement 3)

RIDE HEIGHT MEASUREMENT — REAR *(Cont'd)*



4. With the surface gauge positioned on a flat, level surface, record the measurement of the surface gauge position (measurement 2) and (measurement 3).
5. Subtract measurement 3 from measurement 2 to obtain the rear ride height.

RIDE HEIGHT SPECIFICATIONS

1. NOTE: Base Police ride height at full fuel, as built at CAP, no additional content.

Ride Height

WB, Engine	ITEM	SPECIFICATION
120-in Wheelbase, 3.0L GTDI	FRONT	51.9 mm (2.043 in) ± 12 mm (0.472 in)
	REAR	51.6 mm (2.031 in) ± 10 mm (0.393 in)
120-in Wheelbase, 3.3L	FRONT	61.1 mm (2.405 in) ± 12 mm (0.472 in)
	REAR	62.3 mm (2.295 in) ± 10 mm (0.393 in)
120-in Wheelbase, 3.3L HEV	FRONT	61.1 mm (2.405 in) ± 12 mm (0.472 in)
	REAR	62.3 mm (2.295 in) ± 10 mm (0.393 in)

<IMAGE FOR ILLUSTRATION ONLY>

POLICE MODIFIER GUIDE

SECTION 2 – GENERAL ELECTRICAL INFORMATION

ELECTRICAL BASICS

Throughout a vehicle, electricity is supplied through "hot" wires, comparable to the pressurized supply pipes of a plumbing system. At various points along the wires are electrical loads in the form of lights, switches, and receptacles. Turning on a light switch is somewhat like opening a faucet to let water run; electricity flows through the hot wire to make the light illuminate. Once the electricity has done its work, its potential drops to zero, just as water loses pressure after flowing through a sink or laundry tub. The electrical system has drains, which are the ground wires that return the electricity to its source, just as a plumbing system has drainpipes through which water runs into the sewer mains or ground.

The lights or equipment, technically called the load, can be compared to a water wheel that remains motionless until a stream of water causes it to turn. A load consists of a resistance, a material that permits the passage of electricity, but only with difficulty and thereby creates heat.

Resistance to electricity flowing through a wire can be compared to the resistance given to water flowing through a hose, as if the hose were to be squeezed, it would restrict the flow of water. A load may also be inductive, typically a motor with windings of copper wire, in which the magnetic fields generated by the electrical current creates motion. The tungsten filament of an incandescent bulb or the heating element of an electric heater in a coffee pot would be an example of a resistive load. At any moment, the demand on an electrical system depends on the number of loads in operation and their consumption of energy, just as demands on a water system depend on how many faucets are opened and how wide they are opened.
The mechanics and physical fittings of the system are simple. Electricity moves throughout the vehicle in wires of different sizes, according to the electricity a circuit may have to carry.

Electrical Terms

VOLT is the unit of electrical potential, equal to the difference of electrical potential between 2 points in a circuit. It could be compared to the pressure, or the push, on the water to move it through a pipe.
AMPERE or AMPS is the unit used to measure the amount of electrical flow; the number of electrically charged particles called electrons that flow past a given point in a circuit. It is similar to measuring the amount of water flowing through a pipe at any given point. The larger the pipe is, the more water that can flow past one given point per second. Similarly, the bigger the wire is, the more electricity that can flow past a given point.
WATT is the unit of power. It indicates the rate at which a device converts electric current to another form of energy, either heat or motion. Or to put it another way, the rate at which a device converts energy.

The relationship of volts, amperes and watts to one another is expressed in a simple equation that enables you to make any calculations you may need for proper and safe electrical modifications to the vehicle. Volts x Amps = watts. If the current is at 12 volts and a device requires 4 amperes of current, the equation will read 12 volts x 4 amperes = 48 watts.

To figure the current needed for a device rated in watts, turn the equation around: Watts/volts = amperes. For example, if you have a piece of equipment, such as a communications radio, which uses 120 watts: 120 watts/12 volts = 10 amperes.

CONTROL MODULES — RED AREA

Do not install any components into the control modules or module harness. Connecting into this system may affect control module operation. For example, connecting aftermarket electrical equipment into the brake light circuit or any other circuit which is connected to the PCM, anti- lock brake computer, airbag system or any other vehicle system will cause vehicle malfunction.

CONTROLLER AREA NETWORK (CAN) BUS

NOTICE: Wiring faults in the Controller Area Network (CAN) bus may shut down the vehicle and prevent further operation.
Do not splice or connect any equipment to the CAN bus wiring.

NOTE: 25MY and later PIU's are equipped with the Upfit Integration System (UIS) Module that allows for robust interaction with the CAN Bus. The UIS Module allows for a programmable monitor of the CAN Bus. See Modifiers Guide Section x-xx for information on the new UIS Module.

GENERAL GUIDELINES FOR VEHICLE MODIFICATION

- Provide circuit protection (fuses) for all wiring. The fuse rating should not exceed either the rated wiring current capacity or the total current requirements for all the add-on components on the circuit. Install fuses as close to the point of tapped power as possible.
- Document all revisions to the electrical system and place with the vehicle Owner's Literature. Color code and/or label all revisions or additions to wiring.
- Provide protective covering in all areas that could be damaged during normal equipment installations.
- Air bag restraint systems must remain intact as received from Ford Motor Company. Before modifications are done to the vehicle, the system must be depowered by following the instructions provided in the current Workshop Manual.
- Disconnect the negative battery cable of vehicles stored on site to reduce the possibility of draining the battery by lights or other equipment.
- Do not allow control panels attached to the instrument panel to protrude into the driver and passenger air bag deployment zones. For additional information, refer to Section 5: Reference Information in this guide.
- Do not install switches and gauges in the driver or passenger knee impact areas.
- Inspect all Ford gauges, lights and switches for correct operation after instrument panel work is performed.

SECTION 2 – GENERAL ELECTRICAL INFORMATION

GENERAL GUIDELINES FOR VEHICLE MODIFICATION *(Cont'd)*

- Properly secure any relocated or removed wiring while working behind the instrument panel to prevent chafing, squeaks and rattles.
- Provide adequate retention for wiring harnesses so that they are clear of bolts, corners or edges which could abrade the wires during normal vehicle operation.
- Anticipate incorrectly routed wiring situations and protect all wiring from penetration by screws and raw edges.
- Weather-seal all electrical connectors exposed to the elements.
- Do not use quick splice connectors or wire nuts.
- Install the fuse panel so fuses are readily accessible.
- Make sure that connections are easily accessible for assembly and service.
- Make sure submersible connectors do not lose their seals under extreme assembly conditions such as bending wires 90 degrees immediately after the connector.
- Whenever using connectors, use a socket (female) connector on the electrical source side and a plug (male) connector on the electrical load side to reduce the possibility of a short circuit when disconnected.
- Air bag restraint systems must remain intact as received from Ford Motor Company. Before any vehicle modifications are performed, the system must be disarmed by following the instructions provided in the current Workshop Manual.
- Adherence to the above guidelines is not to be construed as approval by Ford Motor Company of any specific revisions or additions to the vehicle's original electrical system.
- Do not modify the cooling system. High voltage vehicle components may be damaged if any cooling system modifications are attempted.
- Do not back probe, splice or repair the high voltage system (orange) wiring/cables.
- Do not mount to or modify the high voltage system (orange) wiring/cables in any way.
- Do not cut, weld or screw into the HVTB case or penetrate the batteries in any way.
- Provide circuit protection (fuses) for all wiring. The fuse rating should not exceed either the rated wiring current capacity or the total current requirements for all the add-on components on the circuit. Install fuses as close to the point of tapped power as possible.
- Provide protective covering in all areas that could be damaged during normal equipment installations.
- Do not allow control panels attached to the instrument panel to protrude into the driver and passenger air bag deployment zones. For additional information, refer to Section 4: Reference in this guide.
- Do not install switches and gauges in the driver or passenger knee impact areas.
- Provide adequate retention for wiring harnesses so they are clear of bolts, corners or edges which could abrade the wires during normal vehicle operation.
- Properly secure all wiring relocated or removed while working behind the instrument panel to prevent chafing, squeaks and rattles.
- Anticipate mis-routed wiring situations and protect all wiring from penetration by screws and raw edges.
- Weather-seal all electrical connectors exposed to the elements.
- Do not use quick splice connectors or wire nuts.
- Install the fuse panel so fuses are readily accessible.
- Make sure that connections are easily accessible for assembly and service.
- Inspect all Ford gauges, lights and switches for correct operation after instrument panel work is performed.
- Make sure submersible connectors do not lose their seals under extreme assembly conditions such as bending wires 90 degrees immediately after the connector.
- Whenever using connectors, use a socket (female) connector on the electrical source side and a plug (male) connector on the electrical load side to reduce the possibility of a short circuit when disconnected.
- Adherence to the above guidelines is not to be construed as approval by Ford Motor Company of any specific revisions or additions to the vehicles original electrical system.
- Document all revisions to the electrical system and place with the vehicle Owner's Literature. Color code and/or label all revisions or additions to wiring.
- Disconnect the negative battery cable of vehicles stored on-site to reduce the possibility of draining the battery by lights or other equipment.

12 Volt Battery

The 12-volt battery is a standard automotive battery. It is a DC source connected in a negative ground system. The battery case is sealed, with 2 vent holes to release gases. The battery has 3 major functions:

- Storage of electricity for later use
- Voltage stabilizer for the electrical system
- Temporary power source when electrical loads exceed the Direct Current/Direct Current (DC/DC) converter output current.
- Only use the 12-volt (Low Voltage) power point provided in the cargo area on the passenger side under the cargo area floor. NEVER use the High Voltage Hybrid battery to supply power for law enforcement equipment.

AUXILIARY POWER POINT — 12V

WARNING: The nominal high voltage traction battery (HVTB) voltage is 300 volts DC.
WARNING: The high voltage traction battery (HVTB) and charging system contains high voltage components and wiring. High voltage cables and wiring are orange in color.
WARNING: Before carrying out any vehicle modifications, the high voltage traction battery (HVTB) must be depowered. Failure to follow these instructions may result in severe personal injury or death.

NOTE: Do not use the power point for operating the cigarette lighter element (if equipped).

NOTICE: Power outlets are designed for accessory plugs only. Do not insert any other object into the power outlet as this will damage the outlet and blow the fuse. Do not hang any type of accessory or accessory bracket from the plug. Improper use of the power outlet can cause damage not covered by your warranty.

POLICE MODIFIER GUIDE

SECTION 2 – GENERAL ELECTRICAL INFORMATION

AUXILIARY POWER POINT — 12V *(Cont'd)*

To prevent the fuse from being blown, do not use the power point(s) over the vehicle capacity of 12-VDC/180W.

To prevent the battery from being discharged, do not use the power point longer than necessary when the engine is not running.

DC/DC CONVERTER

The DC/DC converter is an air-cooled component that converts high voltage DC power to low voltage DC power. It is part of the high voltage battery pack and maintains an electrical isolation between the 2 DC power systems. This system converts the high voltage (approximately 300 volts) to low voltage (12 volts) that provides power to the vehicle low voltage battery systems. The PCM controls the operation of the DC/DC converter through an enabled input from the PCM to the DC/DC converter.

VEHICLE COMPONENT ELECTRICAL LOADS

Vehicle component electrical loads are shown in the table below. Not all features are powered all the time, so actual vehicle loads on the power supply system will vary.

NOTE: The electric A/C compressor loads are included with the blower loads.
Component/Amps:

- Base
  - Miscellaneous - 16.5 Amps
- Cooling
  - Cooling Fan (Hi- Speed Variable) - 27.0 Amps
- Climate Control
  - A/C Fan To Face – Hi-Speed (Recir. Air) - 25.0 Amps
  - A/C Fan To Face – M/H Speed (Recir. Air) - 16.0 Amps
  - Heater Fan To Foot – M/H Speed (Fresh Air) - 16.0 Amps
- Lighting
  - Ext. & Instr. Pnl Lamps (Non-dimmable) - 3.5 Amps
  - Headlamps – Low Beam - 9.1 Amps
  - Brake Lights (With CHMSL) - 5.1 Amps
- Heated Features
  - Heated Rr Window (Inc. Htd Mirrors) - 18.0 Amps
  - Heated Front Seat – Lh - 4.5 Amps
  - Heated Front Seat – Rh - 4.5 Amps
- Other
  - Radio - 4.0 amps
- Typical Vehicle Load = 95 – 110 Amps

Typical Police Equipment

Loads for equipment commonly found on police vehicles are shown in the table below. Not all equipment will be operating at the same time, so actual loads on the power supply system will vary.

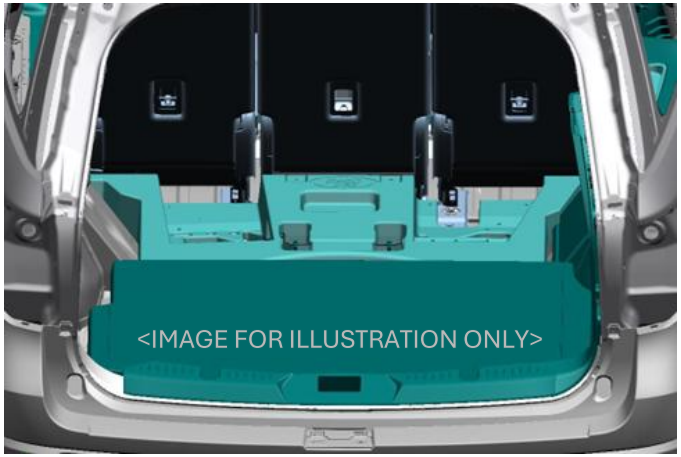
Component/Amps:
Communication Radio - 5.0 – 20.0 Amps
Light Bar - 28.0 – 43.0 Amps
Led Light Bar 6.0 Amps
Siren - 15.0 – 30.0 Amps
Headlamp Flasher - 1.0 – 1.5 Amps
Led Deck Bars/Led Visor Lights - 2.0 Amps
Radar - 0.8 Amps
Receipt Printer 3.0 Amps
Spotlights (Each) - 7.8 Amps
Alley Lights (Each) - 1.0 Amps
Camcorder - 2.0 Amps

POLICE INTERCEPTOR UTILITY HYBRID— REAR POWER ACCESS

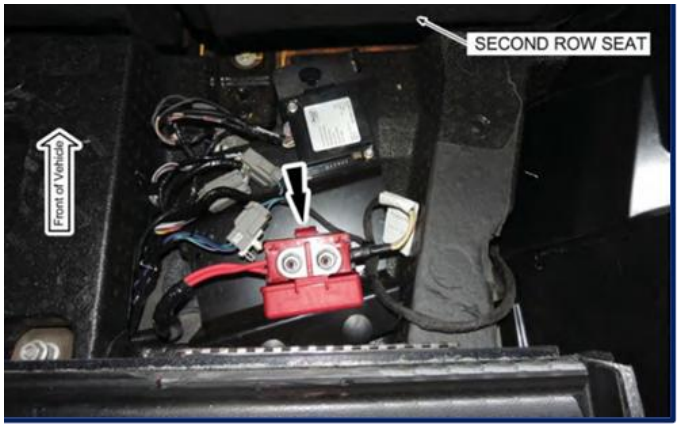
The rear power access point mounted in the cargo area, is a battery access port for police auxiliary equipment. It is capable of supplying 80 amps of battery voltage. Voltage to the positive terminal of the rear power access point is supplied through two 50A, connected to the battery through the power distribution box (PDB) fuses F30 and F31. Battery access is provided by 2 studs contained in an enclosure, behind the passenger second row seat under the cargo area floor. The terminal with the red wire is the battery positive. Remove both fuses in the PDB before removing the cover to the rear power point. Make sure load devices can be turned off and are switched off when reinserting the fuses.
WARNING: Under no circumstances should the rear power access point cover be removed without first removing power distribution box (PDB) fuses F30 and F31. Removing the cover without removing the fuses could result in an electrical hazard. Turn off load devices before inserting the fuses. Failure to follow these instructions may result in personal injury.
NOTE: There is a battery on Hybrid vehicles ONLY in the cargo area on driver side behind the trim panel should NEVER be used as a power source for police equipment and lighting. It is intended for vehicle use ONLY on Hybrid vehicles. This battery does not exist on 3.3L and 3.0L GTDI powertrain vehicles. For upfitting, the power lug on floor in 2nd row below rear portion of seat should be used as the power source for police equipment and lighting.

Police Interceptor Utility Hybrid— Rear Power Access *(Cont'd)*

1. To access the rear power point, fold back the cargo area floor near the second-row seat.

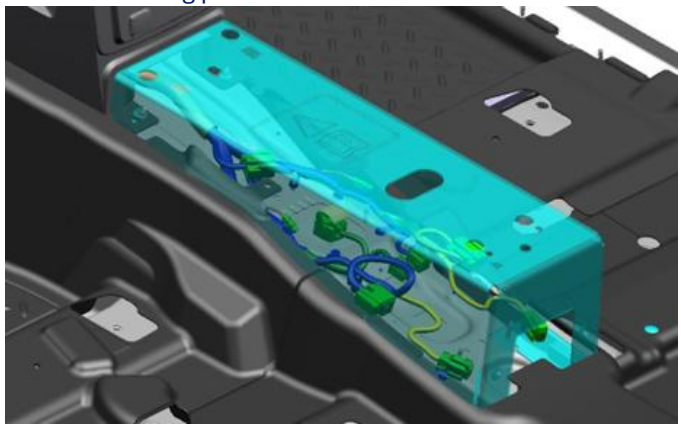


2. Open the cover.

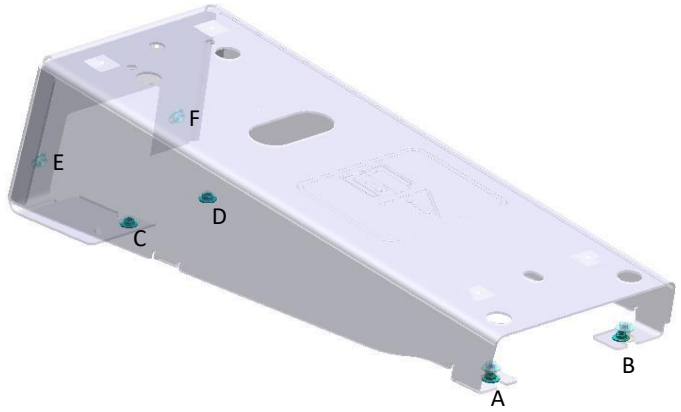


ACCESS TO SIGNALS AND POWER

1. Remove 4 bolts and the rear plate located in between the mounting plate and second row seat.



2. Remove the 4 nuts and the center mounting plate. Torque: 93 lb.in (10.5 Nm)



POLICE MODIFIER GUIDE

SECTION 2 – GENERAL ELECTRICAL INFORMATION

Access to Signals and Power *(Cont'd)*

	GRAY 6 WAY CONNECTOR C3399		
	PIN	DESCRIPTION	COLOR
1	1	BATTERY FEED FUSE #107 (40A)	BU – WH
	2	BATTERY FEED FUSE #106 (40A)	YE
	3	BATTERY FEED FUSE #150 (40A)	BN – RD
	4	GROUND LEFT B PILLAR	BK - VT
	5	GROUND LEFT B PILLAR	BK – VT
	6	GROUND LEFT B PILLAR	BK – VT

	WHITE 14-WAY CONNECTOR C2603		
	PIN	DESCRIPTION	COLOR
2	1	WIG WAG L/SCM TO BCM	OG
	2	~	~
	3	FLASHER FRONT RIGHT (15A MAX FUSE)	YE – VT
	4	~	~
	5	~	~
	6	WIG WAG SYNC	GY – OG
	7	I/P ILLUMINATION	VT – GY
	8	BCM FUSE #30 (5A) TRAILER BRAKE INPUT	YE – BU
	9	~	~
	10	PAITRO	VT / GN Ref. Page 3-7 for Details)
	11	BATT. SAVER/SWITCH OFF INTERIOR LIGHTING	YE-GN
	12	CTRL MOD. – HORN SWITCH	GN-WH
	13	CTRL MOD. – HORN SWITCH	GN-WH
	14	FRONT LAMP STROBE PATTERN	GN-VT (Early Prod.) GN-RD (Late Prod.)

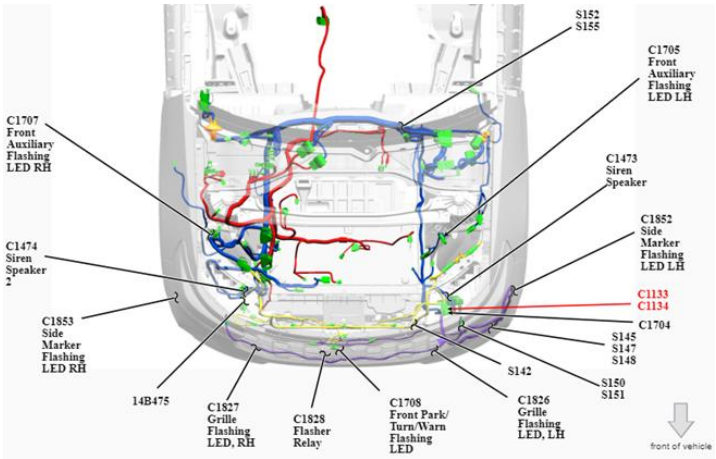
	GRAY 14-WAY CONNECTOR C2238		
	PIN	DESCRIPTION	COLOR
3	1	B+ FEED BJB FUSE #127 (20A)	WH-RD
	2	CONTROL BUTTON 1	GY-BN
	3	CONTROL BUTTON 2	WH-VT
	4	CONTROL BUTTON 3	GN-BN
	5	CONTROL BUTTON 4	YE-GY
	6	POLICE START BJB FUSE #116 (5A) INPUT	BU-BN
	7	RUN/START #1 BJB FUSE #54 (20A)	VY-OG
	8	B+ FEED #2 BJB FUSE #115 (20A)	BU-RD
	9	VEHICLE SPEED	VT-BN
	10	DELAY ACCESSORY BJB FUSE 134 (10A)	VT-GY
	11	B+ FEED #3 BJB FUSE #160 (10A)	VT-RD
	12	PARK DETECT	GN+BU
	13	DRIVER DOOR AJAR	GN-OG
	14	RUN/START #2 BJB FUSE #118 (30A)	GY-BU

WIG WAG

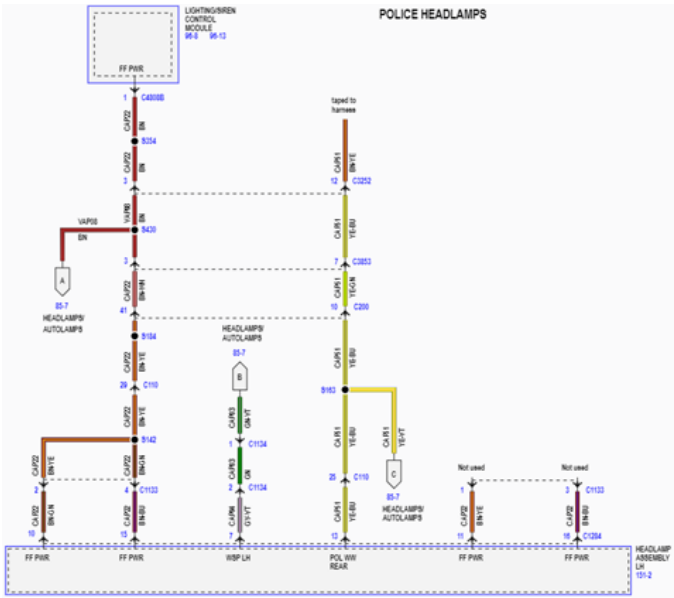
3 flash options are changeable by using FDRS.

Headlight Led Color Change

1. Vehicles equipped with the Headlight LED Option; the LED color is changeable by swapping the pin out in connector. Connector locations shown below.



RH DIAGRAM SHOWN, LH IDENTICAL.



For detailed schematics, please visit:
https://www.motorcraftservice.com/

	CONNECTOR C1133 (CIRCUIT CAP22)	
PIN	DESCRIPTION	COLOR
1	H/L, RUN/START, HEADLAMP LED 4" FLASH RED/ BLUE	BN – YE
2	HEADLAMP LED 4" FLASH WHITE	BN – GN
3	HEADLAMP LED 3" FLASH BLUE	BN – BU
4	HEADLAMP LED 3" FLASH RED	BN – BU

2. The standard set up for the 4" headlamp LED is set to flash White. To change the 4" headlamp LED to flash Red/Blue, remove Pin 2 on the headlamp side of the circuit. Then move Pin 1 to Pin 2.
3. The Standard set up for the 3" headlamp LED is set to flash Red. To change the 3" headlamp LED to flash Blue, remove Pin 4 on the headlamp side of the circuit. Then move Pin 3 to Pin 4.

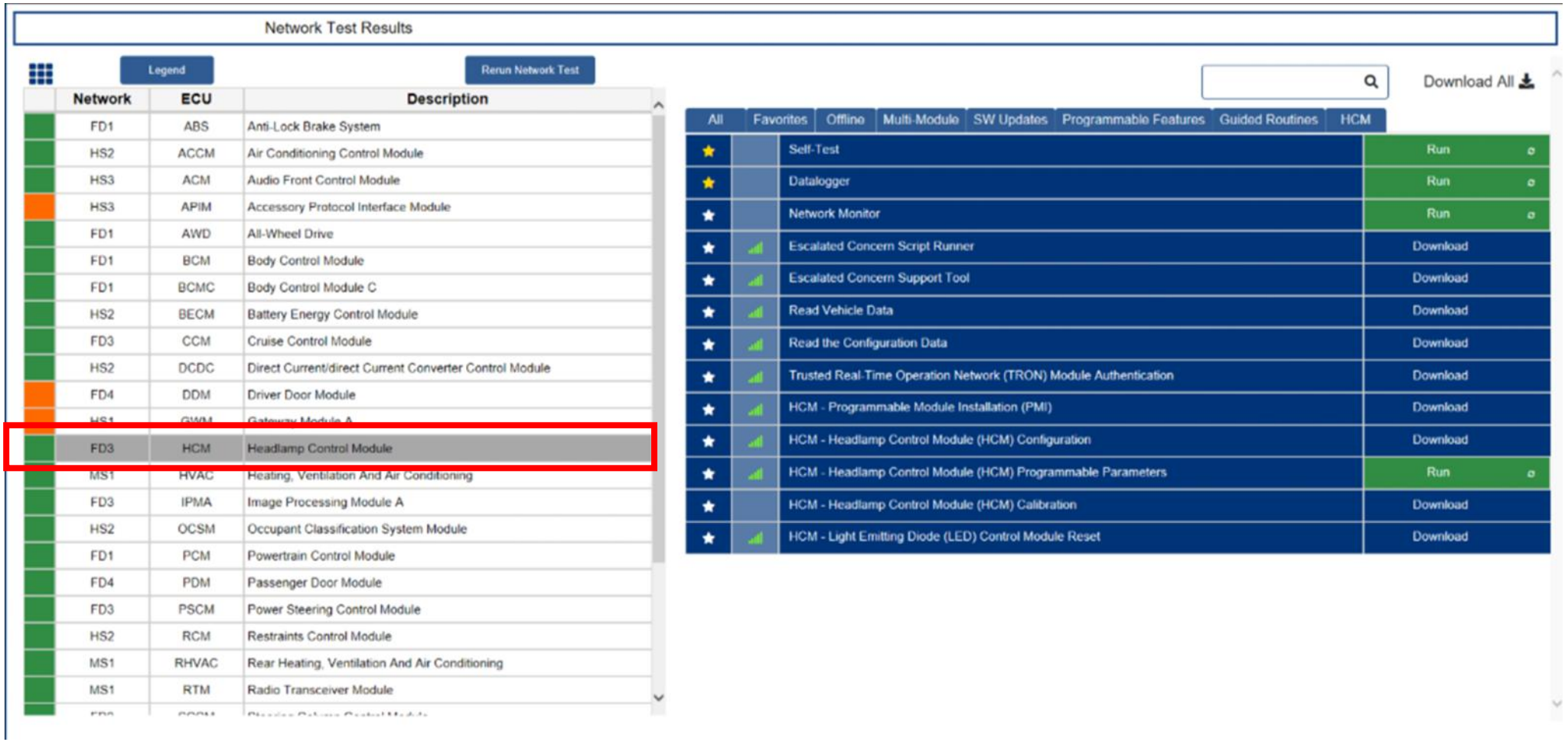
WIG WAG *(Cont'd)*

WIG WAG Pattern Configuration

NOTE: A Ford service scan tool (IDS/FDRS) will be required to perform updates to vehicle electronic systems. Procedures to revise configurations and calibrations can be found in the appropriate vehicle workshop manuals. Upfitters that do not have their own service scan tool can leverage Ford service tools may be purchased from the following website: https://rotunda.service-solutions.com/

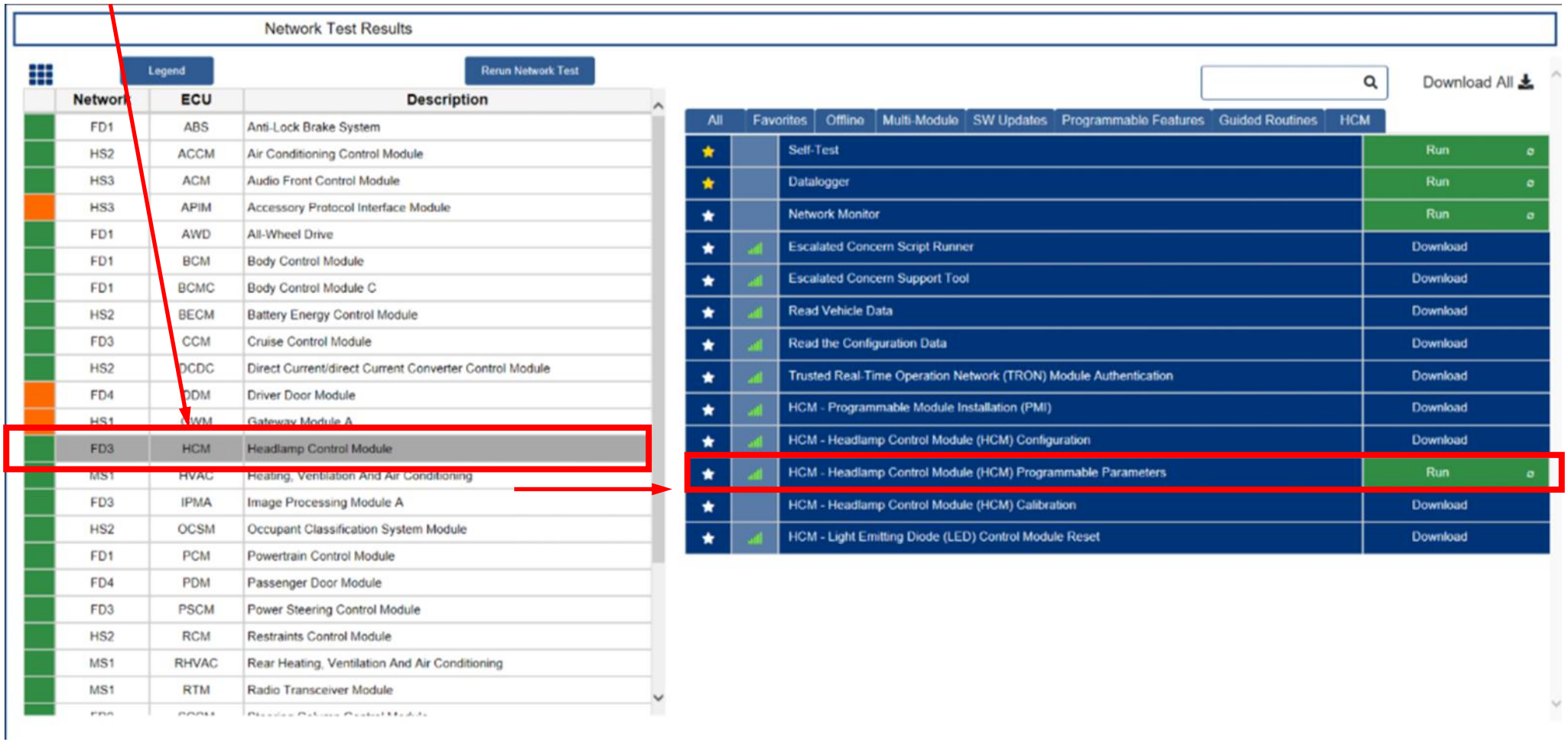
To configure the WING WAG Pattern using the FDRS Tool, please use the following menu instructions.

From initial FDRS Toolbox Menu.
Reference the left column as it displays the modules. Please select the Headlamp Control Module (HCM) from that list.


Network Test Results
Legend
Rerun Network Test
Download All
All
Favorites
Offline
Multi-Module
SW Updates
Programmable Features
Guided Routines
HCM
Network
ECU
Description
FD1 ABS Anti-Lock Brake System
HS2 ACCM Air Conditioning Control Module
HS3 ACM Audio Front Control Module
HS3 APIM Accessory Protocol Interface Module
FD1 AWD All-Wheel Drive
FD1 BCM Body Control Module
FD1 BCMC Body Control Module C
HS2 BECM Battery Energy Control Module
FD3 CCM Cruise Control Module
HS2 DCDC Direct Current/direct Current Converter Control Module
FD4 DDM Driver Door Module
FD3 HCM Headlamp Control Module
MS1 HVAC Heating, Ventilation And Air Conditioning
FD3 IPMA Image Processing Module A
HS2 OCSM Occupant Classification System Module
FD1 PCM Powertrain Control Module
FD4 PDM Passenger Door Module
FD3 PSCM Power Steering Control Module
HS2 RCM Restraints Control Module
MS1 RHVAC Rear Heating, Ventilation And Air Conditioning
MS1 RTM Radio Transceiver Module
Self-Test Run
Datalogger Run
Network Monitor Run
Escalated Concern Script Runner Download
Escalated Concern Support Tool Download
Read Vehicle Data Download
Read the Configuration Data Download
Trusted Real-Time Operation Network (TRON) Module Authentication Download
HCM - Programmable Module Installation (PMI) Download
HCM - Headlamp Control Module (HCM) Configuration Download
HCM - Headlamp Control Module (HCM) Programmable Parameters Run
HCM - Headlamp Control Module (HCM) Calibration Download
HCM - Light Emitting Diode (LED) Control Module Reset Download

WIG WAG *(Cont'd)*

Select the HCM, it will display the HCM module on the righthand side – "HCM – Headlamp Control Module (HCM) Programmable Parameters."

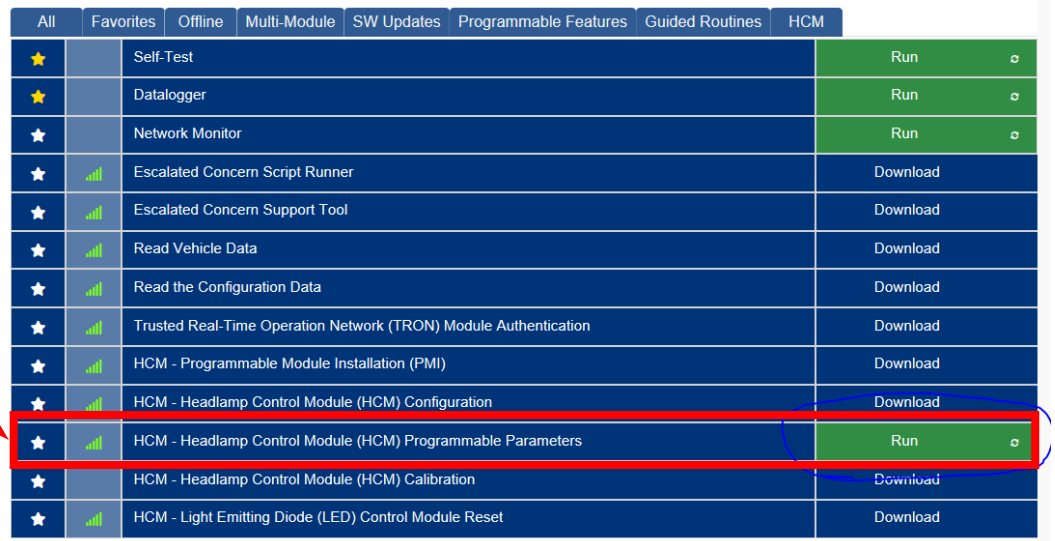

Network Test Results
Legend
Rerun Network Test
Network
ECU
Description
FD1 ABS Anti-Lock Brake System
HS2 ACCM Air Conditioning Control Module
HS3 ACM Audio Front Control Module
HS3 APIM Accessory Protocol Interface Module
FD1 AWD All-Wheel Drive
FD1 BCM Body Control Module
FD1 BCMC Body Control Module C
HS2 BECM Battery Energy Control Module
FD3 CCM Cruise Control Module
HS2 DCDC Direct Current/direct Current Converter Control Module
FD4 DDM Driver Door Module
FD3 HCM Headlamp Control Module
FD3 IPMA Image Processing Module A
HS2 OCSM Occupant Classification System Module
FD1 PCM Powertrain Control Module
FD4 PDM Passenger Door Module
FD3 PSCM Power Steering Control Module
HS2 RCM Restraints Control Module
MS1 RHVAC Rear Heating, Ventilation And Air Conditioning
MS1 RTM Radio Transceiver Module
Download All
All
Favorites
Offline
Multi-Module
SW Updates
Programmable Features
Guided Routines
HCM
Self-Test Run
Datalogger Run
Network Monitor Run
Escalated Concern Script Runner Download
Escalated Concern Support Tool Download
Read Vehicle Data Download
Read the Configuration Data Download
Trusted Real-Time Operation Network (TRON) Module Authentication Download
HCM - Programmable Module Installation (PMI) Download
HCM - Headlamp Control Module (HCM) Configuration Download
HCM - Headlamp Control Module (HCM) Programmable Parameters Run
HCM - Headlamp Control Module (HCM) Calibration Download
HCM - Light Emitting Diode (LED) Control Module Reset Download

WIG WAG *(Cont'd)*

User will locate the selection for "HCM - Headlamp Control Module (HCM) Programmable Parameters." Select the download button to the right of the tool name.

Once downloaded, the button will turn green and indicate "Run".

Select 'Run,' the function will begin.



Follow the prompts displayed by the service tool. The tool will provide a prompt for the user to select the type of WIG WAG strobe to be enabled.

This would include:

- None- Wig Wag Off
- Type One- Ping Pong
- Type Two- Triple Ping Pong
- Type Three- Triple Triple
- Exit (Will exit the configuration application)

Choose the appropriate strobe type and select the continue to configure to the Headlamp Control Module. The Scan Tool will provide a "Successful Completion" notification and then prompt for the ignition to be cycled to the off position when the configuration is complete. Follow the instructions and the press the "EXIT" from the Tool Menu screen. Verify that the Wig Wag Functions operate as expected.

POLICE MODIFIER GUIDE

SECTION 2 – GENERAL ELECTRICAL INFORMATION

STEERING WHEEL SWITCH OUTPUT

The four Steering Wheel Switches can provide inputs to the Vehicle Integration System or control an output via TTM module. The output for each switch can be used/programmed via the new Vehicle Integration System 2.0 Module to create a level of logic output from the Vehicle Integration System.

POLICE ACCESSORY INDEPENDENT TIME RELEASE OUTPUT (PAITRO)

PAITRO feature is tied the liftgate release button in overhead console and allows the Police officer to release a handcuff (third part accessory) commonly used to lock a gun or other vital equipment. It is tied to the 45 Second timer used for the liftgate release. PAITRO is ONLY available when ordering the Standard Liftgate Release Feature. PAITRO is disabled when ordering.

- Global Lock / Unlock feature (Door-panel switches will lock/unlock all doors and rear liftgate. Eliminates the 45-second Liftgate Lock Release + PAITRO Timer (Option Code: 18D)
  NOTE: Overhead Liftgate Button and Blue Liftgate Release Button on key fob will NOT have any function when pressed with this option.

EQUIPMENT GROUNDING GUIDELINES

- Do not ground the body to the transmission or transmission crossmember. Ground accessories to the chassis or the vehicle battery.
- Splicing into circuitry relating to the electronic engine and/or transmission control systems is not acceptable because of the adverse effect on the electronic system operation.
- Adequately protect electrical connections exposed to the elements.

WIRE INSULATION

- Polyvinyl chloride (PVC) rated at 90°C (194°F) is the standard wire insulation acceptable for inside body use but is not acceptable for underhood/underbody wiring.
- Hypalon insulation should be used on links only (Ford specification ESB-M1L54-A).
- Cross-linked polyethylene (XPLPE or SXL) rated at 125°C (257°F) is the required insulation for underhood/underbody applications (Ford specification ESB-M1L123-A).
- GXL can be used as an alternate wire (Ford specification ESB-M7L85B) as long as the concentricity specifications are met. To provide a water-resistant seal in conjunction with crimp connectors, a Duraseal® crimp connector is recommended since it is designed to account for outside wire diameter that is smaller than the present SXL wire.

TERMINALS AND CONNECTORS

Connector Types:

- Submersible (sealed) — A connector that is capable of being immersed in water.
- Weather-resistant — A connector that will retain its sealing and connection qualities while being exposed to adverse weather conditions.
- Duraseal® crimp — A supplier trade name for a sealed wiring repair or splice.

When a connection is not defined (typical situation — harness-to-harness connectors), the following suggestions should be implemented:

- Determine the connector type. If the vehicle will be located in an area exposed to water, salt accumulation and/or high temperatures (such as underhood, exterior panels and footwells), use a sealed connector. Use in-line connectors with secondary locks to prevent the terminal from being pushed out.
  - Do not use single wires smaller than 14 gauge in a 2-way or larger weather-resistant connector (the very large style), since the wire may break during disengagement.
  - Use Hypalon, XLPE or Elexar insulation in submersible connectors to maintain sealing integrity. PVC is not acceptable because its properties allow it to set in a deformed pattern, therefore compromising the integrity of the seal.
- Determine the terminal type. Base your decision on wire gauge, current carrying capacity, connector type and insulation type.
  - Use non-detent low insertion force terminals whenever possible.
  - Do not use low insertion force female terminals in weather-resistant connectors.
  - Analyze circuit requirements (signal levels, current, voltage) to determine the proper plating material (such as gold). Use of non-plated terminals is not recommended.
  - Do not use plugs to seal holes in micropin connector grommets. It is very easy to forget to insert them during manufacturing and ruin the seal. Use a grommet with only the necessary number of holes or use dummy wires at least 600 mm (24 in) long.
  - Fully align connectors prior to terminal connection — terminal cavities should have minimum tolerance to prevent terminals from floating, bending or pin push-out during mating/engagement.
  - Make sure connectors of similar type and color are identifiable to the operator to eliminate crossed connections and minimize assembly time. Avoid using similar types and colors of connectors close together.
  - Be sure that connectors have positive locking devices that allow easy installation with a low insertion force and easy removal. The connector snap should be easily felt and heard.
  - Eliminate the use of edge board, tang-type and molded-over connectors. The use of blade-type weather-resistant connectors is restricted to high-current applications which cannot be handled by submersible connectors.

TERMINALS AND CONNECTORS *(Cont'd)*

Circuit Protection and Electrical Load

- Modification to the vehicle's existing low voltage (12 volts) wiring should be done only with caution and careful consideration of effects on the completed vehicle's electrical system. Anticipated circuitry should be studied to determine the required circuit protection and to avoid feedback loops.
- Added circuitry must be protected either by a base vehicle fuse or circuit breaker, or by a similar device supplied by the modifier.
- When adding loads to a base vehicle-protected circuit, make sure the total electrical load through the base vehicle fuse or circuit breaker is less than the devices load rating.
- Use 80% of the fuse rating to determine maximum steady state load to reduce nuisance fuse failures.
- Use 135% of the fuse rating when sizing wiring to protect the circuit in the event of an overload. Fuses will last for one hour at 135% of their rating.
  - Total current draw is the sum of the base vehicles circuit current requirement (measured with an ammeter) and the anticipated add-on component current requirements.
  - Never increase the rating of a factory installed fuse or circuit breaker.
  - If the total electrical load including additional electrical components, on any circuit, is less than the fuse protection rating or the capacity of some limiting component (switch, relay), the items to be added can be connected directly to that circuit. The headlamp switch circuits should never have additional lighting or electrical components directly connected.
  - Added devices that exceed the current capabilities of the factory-installed system are best controlled through the use of a relay or separate switch. The coil of the relay can be fed from the circuit in the factory harness (now acting as a signal circuit) with added wiring providing feeds to the added electrical device. The relay selection is important and depends on current requirements, number of cycles expected in the relay lifetime, whether the relay is to be operated intermittently or for long periods of time and whether the relay is exposed to weather conditions or is installed in a protected area. When the current requirements of a circuit exceed the capacity of an available relay, the load should be reduced or divided through the use of additional relays.

WIRE PROTECTION REQUIREMENTS

General Notes

- Anticipate problems and design accordingly. Try to anticipate what could go wrong and modify your designs to address any adverse impact.
- Review all connector applications and electrical systems to determine the need for solder, grease, weather-resistant or sealed connectors. Make sure components and wire insulation are compatible with greased connectors (important for long-term durability).
- Make sure that drip loops or other means are provided to prevent water leakage into the vehicle through wiring assemblies that pass through the dash panel.
- Use greased or sealed connectors in floor pan troughs which are subject to moisture coming through the carpeting.
- Use XLPE insulation for uncovered runs that exceed 305 mm (12 in).

Electrical Protection

- Properly route wires away from noise-generating wires or components. However, if routing near noisy wires or plugging into noisy components is unavoidable, design additional protection into the harness.
- Electromagnetic interference (EMI) shielding — Consider shielding if you must route close to high-current or noisy circuits. Use shielded wire and ground one side. Seal all splices in wire assemblies that use bare coaxial shielding (braid or tape) for EMI suppression and insulate or tape over all shielding ends that terminate near any open connectors. This prevents splice and terminal shorts to the shielding. Minimize the length of conductors which extend beyond the shield. Failure to do this reduces the effectiveness of the shield.
- Spike suppression, in general, is accomplished by connecting a diode or resistor-diode combination across the terminals of the noisy component. The diode should be sufficiently close to the component (both electrically and physically) so that inductive spikes are clamped off. Make sure the diode is connected with the proper polarity.

Proper routing and retention reduce the likelihood of chafing or pinching. When this ideal routing is unattainable, the following additional protection is needed.

Mechanical/Environmental Protection

NOTE: This is not meant to be an all-inclusive list of methods for physically protecting the wires. There are other means of protection available that are not listed.

- Tape — Tape is the most basic means of protection. It contains the wires in a loose bundle and provides limited environmental protection. It does not protect against chafing and pinching.
  - Kendall polyken fiberglass base tape (Ford specification ESB-M3G38-A) is used for engine compartment applications. This durable tape provides protection against cut-through and abrasion commonly found in underhood applications.
  - Polyken 267 is a substitute tape that may be used in lower temperature areas of the engine compartment (apron area).
- Convolute — Use convolute for all underhood/underbody applications or when increased temperature, abrasion or pinch resistance is required. Convoluted tubing comes in different diameters and materials to accommodate different temperature ranges and harness sizes.

Mechanical/Environmental Protection *(Cont'd)*

- Use polyethylene convolute when abrasion is the only consideration; this convolute is adequate up to 96°C (205°F) maximum. Use nylon convolute when underhood/underbody or abrasion and temperature are considerations; nylon convolute is adequate up to 177°C (350°F) maximum.
- On all engine-mounted wiring or bend points, use vinyl tape on the outside of the convolute to prevent wiring from looping out. This tape must be able to withstand temperatures 135°C (275°F) or higher.
- Tape convolute junctions with abrasion-resistant tape (Polyken 267, fiberglass).

- Scroll — Similar to convolute, but without the ridges. Scroll is used where harness rigidity is required, especially for maintaining critical locator dimensions. Use scroll for short lengths only, as it is inflexible.

REPLACING THE FORD OEM ANTENNA TO AN AFTERMARKET ANTENNA

NOTE: With SYNC based radio – it is NOT possible to adjust the date on the SYNC unit with the control panel.

To be able to change the date on the SYNC unit, use following process:

- Park the vehicle in an open area to get a GPS signal and provide the correct date.
- Leave the key in "ON" position.
- Disconnect the OEM antenna.
- Replace the antenna with aftermarket antenna.

NOTE: However, every time the battery gets disconnected (or drops below 9V) the date will revert back to 01-01-2000 so they would have to reconnect the OEM antenna each time the battery cable is reconnected to allow the Date to update via GPS signal. Not a very robust work- a-round but there is no alternative other than leaving the date incorrect.

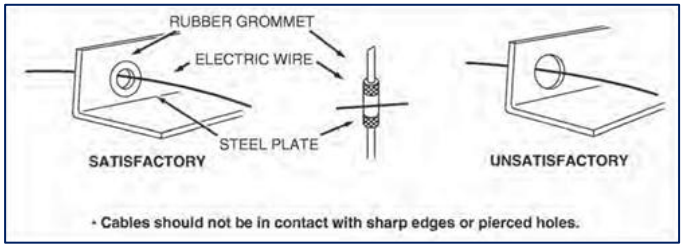
WIRE ROUTING AND RETENTION

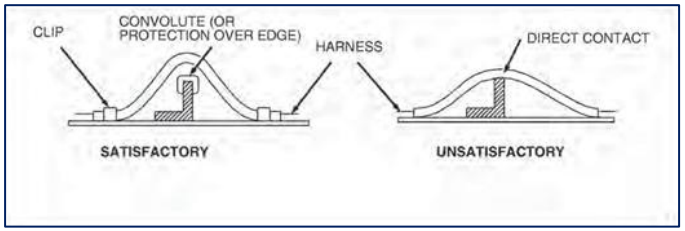
Wire Routing

WARNING: Do not place electrical component attachments or ground screws adjacent to vehicle fuel tanks, fuel filler pipes, fuel lines, fuel vapor lines or carbon canisters. Failure to follow these instructions may result in severe personal injury in the event of a collision.

Wire harness routing should conform to the following:

- Protect wires routed through holes in sheet metal or castings with a grommet whether or not conduit is used (see figure).





- Route wires to avoid metal edges, screws, trim fasteners and abrasive surfaces. When such routing is not possible, use protective devices (shields, caps) to protect the wires. Cover metal edges with a protective shield and fasten the wiring within 76 mm (3 in) on each side of the edge (see figure below).
- Route wires to provide at least 76 mm (3 in) of clearance to moving parts in their extreme movement location, unless positively fastened and protected by conduit.
- Avoid wire routing without conduit in areas where temperatures exceed 82°C (180°F). Heat insulation and heat shields must be used on the wires routed in high-temperature areas.
- Make certain that all underhood or underbody wiring is cross-linked polyethylene high-temperature insulation wire 135°C (275°F) (minimum rating) consistent with SAE specification J1128 Type SXL wire. Normal PVC wire must not be used in underhood or underbody applications.
- Make sure all ground locations are readily accessible for installation, service and verification.
- Do not place ground attachments in high splash areas.
- Underhood/underbody wiring must be routed in conduit for protection. Minimum conduit rating is 177°C (350°F).

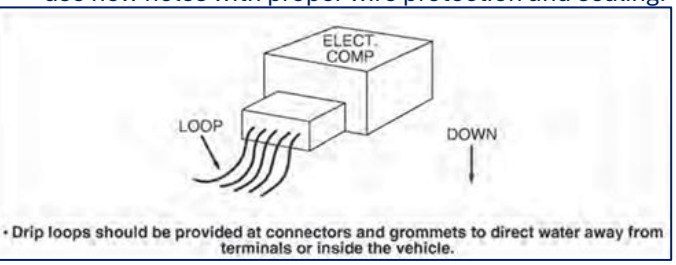
Wire Retention

Use the following criteria to determine the location of retainers:

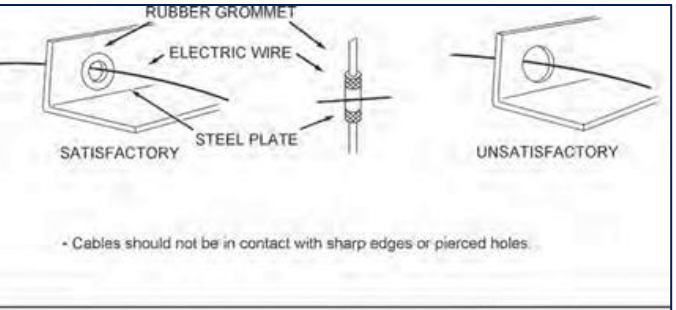
- Size and weight of wire bundle.
- Holes with poor accessibility that prevent installation of locators.
- Movement of wires that can result in abrasion, squeaks and rattles.
- When wiring is routed between 2 members where relative motion can occur, the wiring should be secured to each member with enough wire slack to allow flexing without damaging the wire.
- Wiring exposed to weather must provide a drip loop to prevent moisture from being conducted into the device through the wire connection (see figure below).
- Avoid routing wires into areas exposed to wheel splash. When such routing cannot be avoided, adequate clipping and/or protective shields are required to protect the wires from stone and ice damage. Allow adequate slack in wiring between the engine and stationary components to compensate for engine roll.
- Avoid routing wires under the frame side members or at points lower than the bottom frame flange.
- Use plastic zip straps for bundling only (securing to other wires).

WIRE RETENTION AND ROUTING *(Cont'd)*

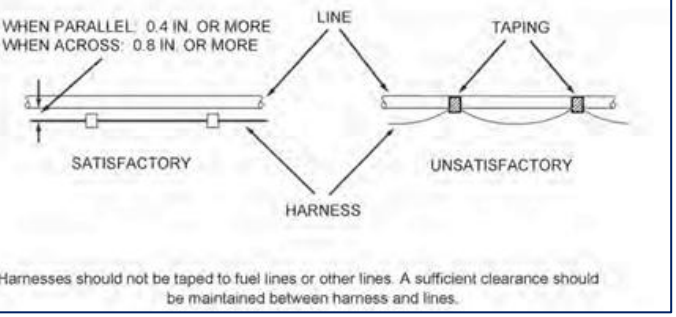
- The wire retainers and grommets installed by the assembly plant are usually designed to accommodate only the Ford-installed wires. Additional wiring or tubing should be retained by additional clips. When added wires or tubes are routed through sheet metal panels, use new holes with proper wire protection and sealing.



- Drip loops should be provided at connectors and grommets to direct water away from terminals or inside the vehicle.



- Cables should not be in contact with sharp edges or pierced holes.

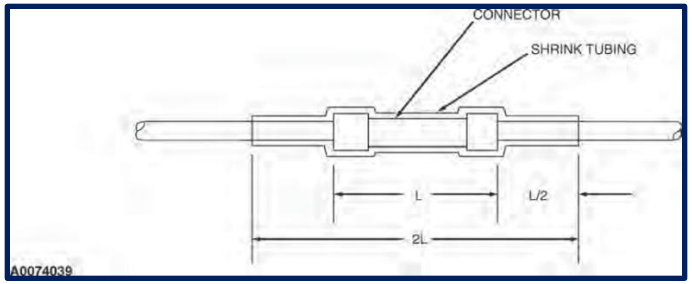


Harnesses should not be taped to fuel lines or other lines. A sufficient clearance should be maintained between harness and lines.

WIRE SPLICES AND REPAIRS

WARNING: Do NOT splice into or repair high voltage (orange) wiring/cables. The high voltage in this system is approximately 300 volts DC. Failure to follow these instructions may result in severe personal injury or death.

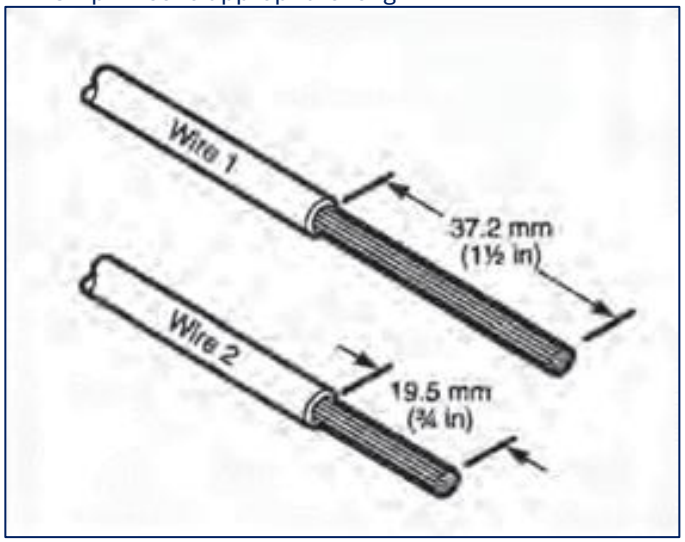
- Stagger the splices within a harness to reduce increased harness diameter. Splice only on straight areas as installed, not on bends.
- Strip wire ends, making sure that individual conductor strands are not damaged.
- When soldering, make sure an adequate mechanical joint exists before applying solder. Use only resin-core solder. Acid-core solder should not be used since it may result in corrosion.
- For crimp joints, use butt-type metal barrel fasteners and the proper tool at the appropriate setting for the wire size (such as Motorcraft® Crimp Tool S-9796) specifically designed for this type of work.



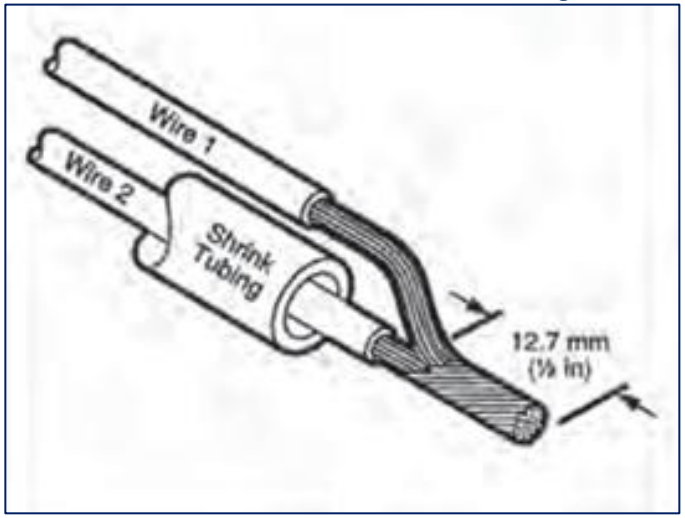
- Make sure splice joints are adequately sealed and insulated. In an outside environment, use Duraseal® butt connectors or equivalent. A durable substitute splice joint can be achieved by using a bare metal barrel, crimping, flow-soldering and covering with shrink tubing. Quality electrical tape can be used inside the vehicle but is not recommended for an outside environment.
- Make sure the new wire is not a lesser gauge than its original mating wire.

Recommended Splicing Method — Solder (For 16 AWG and Smaller Diameter Wire Only)

1. Disconnect the battery ground cable.
2. Strip wires to appropriate length.

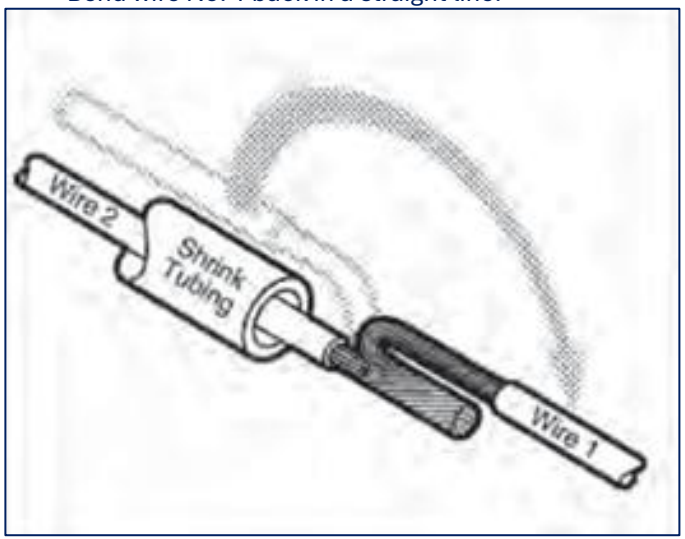


3. Install heat shrink tubing.
4. Twist the wires together.
   NOTE: Use resin-core mildly activated (RMA) solder. Do not use acid-core solder. Solder wires together.

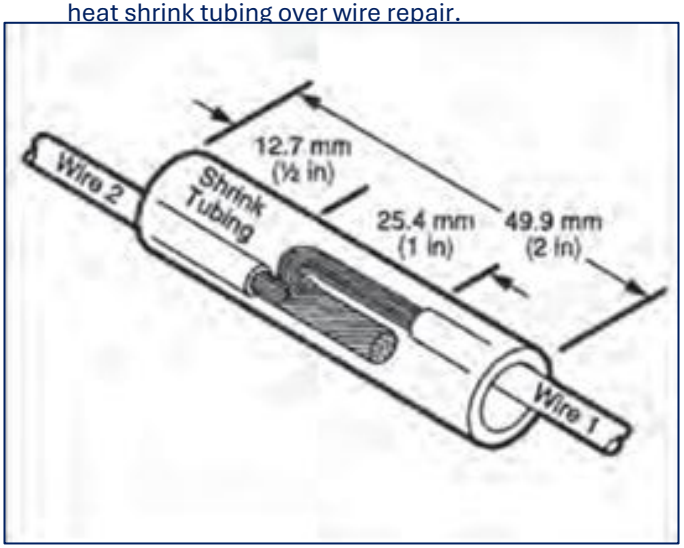


Recommended Splicing Method *(Cont'd)*

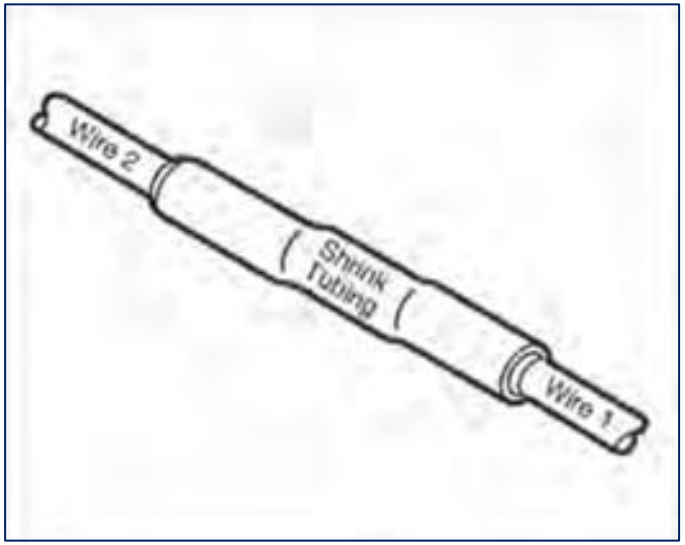
5. NOTE: Wait for solder to cool before moving wires. Bend wire No. 1 back in a straight line.



6. NOTE: Overlap tubing on both wires. Evenly position heat shrink tubing over wire repair.



7. Use a shielded heat gun to heat the repaired area until adhesive flows out of both ends of heat shrink tubing.



8. Reconnect the battery ground cable.

Sealed Connectors

PART NUMBER	PART NAME	CLASS
E6FZ-14488-A	BUTT CONNECTOR GAUGE: 18-22, COLOR: RED	C
E6FZ-14488-B	BUTT CONNECTOR GAUGE: 14-16, COLOR: BLUE	C
E6FZ-14488-C	BUTT CONNECTOR GAUGE: 10-12, COLOR: YELLOW	C

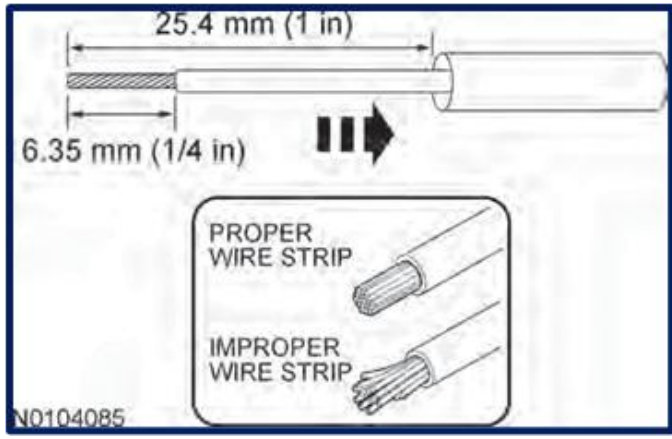
Heat Shrinkable Tubing (Heat Shrink)

(Ford Specification ESB-M99D56-A2)
Heat shrinkable tubing is available in various diameters for different splice sizes and configurations. When shrunk, it forms a small, flexible hermetic seal.

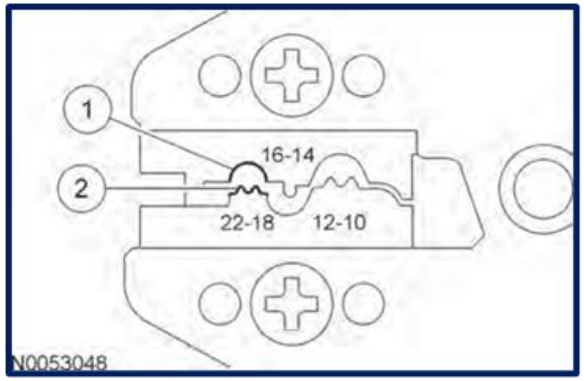
Other methods (tape, PVC mold) do not provide a hermetic seal and are not recommended. Splice balancing is critical with heat shrink insulation. If the splice is extremely unbalanced (more circuits on one side than the other), heat shrink insulation will not provide a proper seal. Evaluate the use of double terminals instead of splices where practical in these situations.

Recommended Splicing Method — Crimp (For 10 - 22 AWG Diameter Wire to Like Wire Diameter)

1. Disconnect the battery ground cable.
2. Strip wires to appropriate length.
3. Install heat shrink tubing.
4. Select the appropriate wire splice for the wires to be spliced from Rotunda Wire Splice Kit 164-R5903.

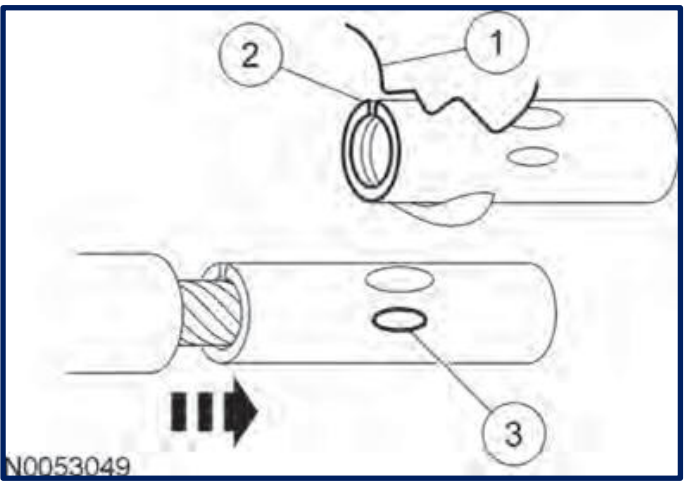


5. NOTE: Rotunda Pro-Crimper 164-R5901 supplied with the wire splice kit is the only tool that can be used with these splices. Identify the appropriate chamber on the Rotunda Pro-Crimper by matching the wire size on the dies with the wire size stamped on the butt splice.
   i. Cavity
   ii. Indenter

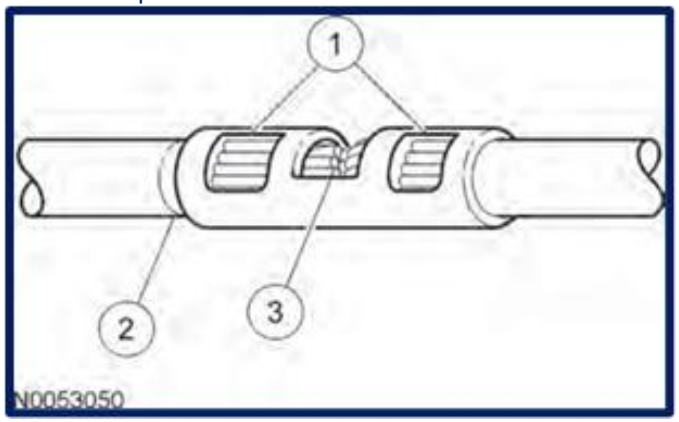


Recommended Splicing Method — Crimp (Cont'd)

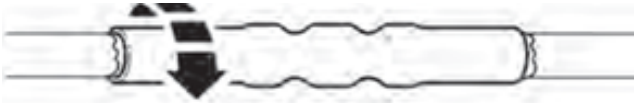
6. Crimp the connector.
   i. Center one end of the wire splice in the appropriate crimping chamber.
   ii. Insert stripped wire into the barrel.
   iii. Holding the wire in place, squeeze the tool handles until the ratchet releases.



7. Repeating Step 6, crimp the other half of the splice.
8. Check for acceptable crimp.
   i. Crimp should be centered on each end of the butt splice.
   ii. Wire insulation does not enter butt splice.
   iii. Wire is visible through inspection hole of splices.



9. Evenly position supplied heat shrink tubing over wire repair.
10. Use a shielded heat gun to heat the repaired area until adhesive flows out of both ends for the heat



11. Reconnect the battery ground cable.

GROMMETS AND SEALING REQUIREMENTS

Any additional wiring routed through sheet metal must pass through a grommet that both seals the opening and locates the wire(s). Two-piece grommets (rubber with plastic inserts) are recommended to facilitate installation and retention.

- Locate grommets so they are accessible for proper seating (achieved by pulling) in sheet metal holes.
- Ramp grommets at the insertion end to facilitate installation and sealing.
- Be sure the direction of the hole punch is in the direction of grommet seating and the hole is burr-free.
- Make sure the grommet molding compound adheres to the harness to prevent slippage.
- Make sure the grommet will withstand the environment (temperature, wet conditions).
- Be sure the holes are large enough to allow the installation of the harness without causing circuit damage.
- Use adhesive tape on main trunks or branches with at least a 50% overlap to prevent wicking through grommets. Be certain to diaper- wrap the takeouts.

Upfitter Sealing Pass-through Points/Openings

Aftermarket upfit modification of hybrid interceptor utility vehicles can result in openings that allow external air and its contents to enter the vehicle that have not been sealed to original design intent.

Examples of openings in some areas that were not properly sealed and allowed external air and its contents to enter the cargo area. Proper care and due to diligence must be used on all openings at any location on the vehicle from the dash panel to the rear of the vehicle.

Examples from a utility police interceptor that are not properly sealed are shown below.

Sealing Recommendations

- ***Any and all holes created, or existing grommets affected during upfit which are exposed directly or indirectly to outside air MUST be completely sealed using Motorcraft® Seam Sealer (TA-2-B).***
- Wiring passing through sheet metal and/or existing grommets behind the passenger and driver side tail lamps must be fully sealed using Motorcraft® Seam Sealer (TA-2-B).
- Pass-through or other openings of similar size should be sealed using the recommended foil-backed mastic patch.
- Foil-backed mastic patch should be used to cover and seal body openings.
  - Foil-backed mastic patch service part number:
    - 4L3Z-18203A16-AA; size of patch - 1.5 x 147 x 330mm
    - DA5Z-65203A16-A; size of patch - 1.5 x 100 x 300mm

GROMMETS AND SEALING REQUIREMENTS *(Cont'd)*

Liftgate Bulb Seal

- If the light bulb seal is damaged, or removed for any reason, it should be replaced and properly seated and sealed.
- If the liftgate is damaged, or removed for any reason, it should be replaced and properly seated and sealed.

Underbody

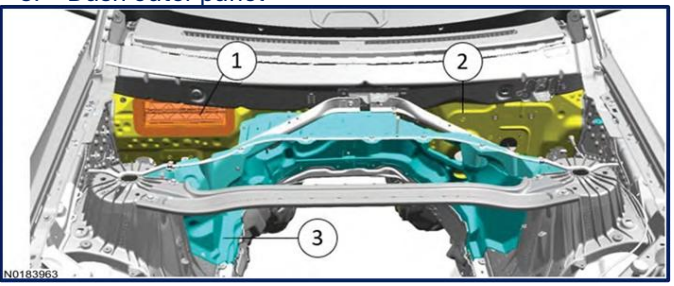
- Seal any holes found in the body with Motorcraft® Seam Sealer (TA-2-B).
- Replace any damaged parts. The following are some examples:
- Spare tire tub.
- Auxiliary A/C pass-through.
- Air extractors (replace if damaged).
- Wiring grommets.
- Body plugs.
- Floor pan.

Dash Panel

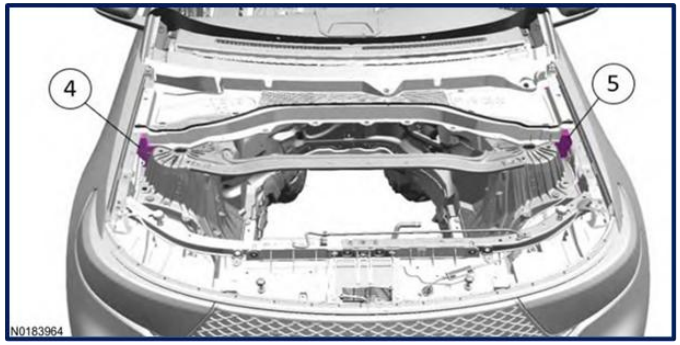
Any seals and/or holes in the dash panel must be replaced and/or properly sealed using Motorcraft® Seam Sealer (TA-2-b).

The cavity between the inner dash panel and outer dash panel feeds the HVAC fresh air intake vent. Original sealing components for the dash panel cavity must be retained to avoid intake of engine bay air through the HVAC fresh air intake.

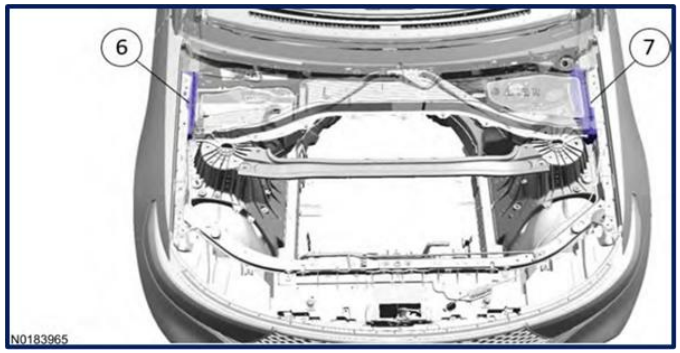
1. HVAC fresh air intake vent.
2. Dash inner panel
3. Dash outer panel



4. Passenger side foam corner stuffer.
5. Driver side foam corner stuffer.



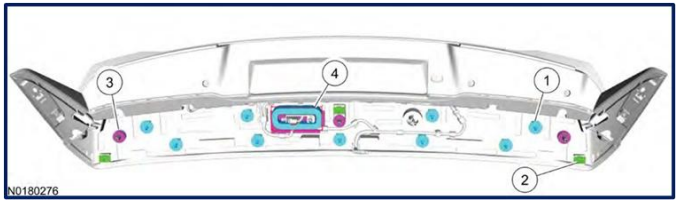
6. Passenger side foam fender stuffer (underneath leaf screen).
7. Driver side foam fender stuffer (underneath leaf screen).



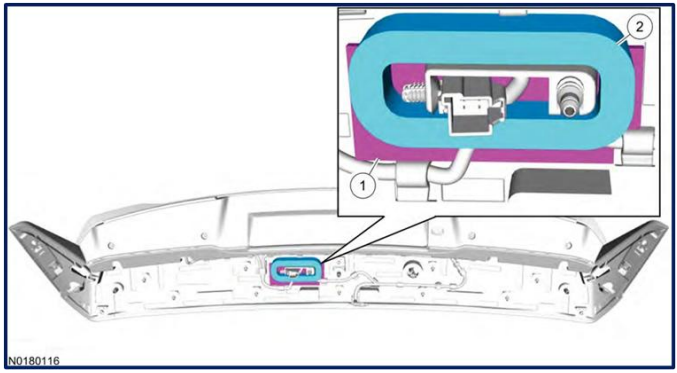
REAR SPOILER REMOVAL AND INSTALLATION

NOTE: Any time the rear spoiler is removed you MUST replace all retainers and gaskets.

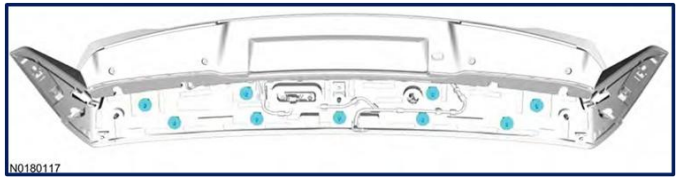
1. Removal of the rear spoiler requires all the gaskets and retainers to be replaced to ensure a proper seal.
   - Item 1 — Nine w-clips with foam gaskets installed.
   - Item 2 — Three studs with foam gaskets installed.
   - Item 3 — Three indicator tab foam gaskets.
   - Item 4 — Two-piece foam tower gaskets.



2. Foam tower seal is made of two foam seals located near the center of the spoiler.
   - Item 1 — Flat gasket that is square in shape and is positioned under the washer lines.
   - Item 2 — Oval gasket that is positioned on top of the washer lines to complete the seal.

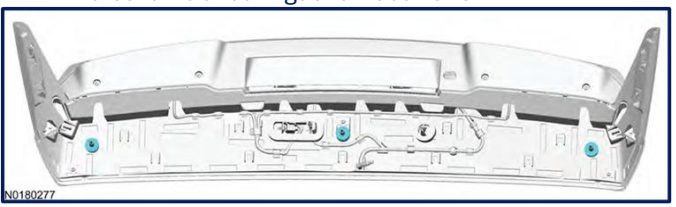


3. W-clip retainer locations.



REAR SPOILER REMOVAL AND INSTALLATION *(Cont'd)*

4. Indicator tab foam gasket locations.



5. Retainer stud with foam gasket locations.

NOTE: Seal any holes in the cargo area of the interceptor utility with Motorcraft® Seam Sealer (TA-2-B).
If the seal is damaged it should be replaced.

VEHICLE DECOMMISSIONING

Vehicle Sealing of Aftermarket Equipment

At the end of its useful life as a police vehicle, many vehicles are decommissioned by having the lights, wiring and other equipment removed. The vehicles are sold for other uses such as retail applications. The openings remaining in the body/components are potential leak paths for exhaust gas into the cabin under certain conditions. These openings must be sealed prior to the vehicle going to auction or any other application.

When customized equipment has been removed from the vehicle, body panels and seals may be compromised. Thoroughly inspect the vehicle for any signs where the equipment has been removed, such as holes and damage to body seals.

Any openings should be sealed with a plug and a sealant. The opening can be modified to enable a plug to seat properly promoting a better sealing surface. The sheet metal surface with the opening should be treated to prevent corrosion prior to inserting the plug and sealant. Any items that remain on the vehicle must be inspected and any sign of damage repaired immediately. Failure to follow this instruction may result in water and exhaust fumes entering the passenger compartment.

See your authorized Ford dealer for more information and direction regarding proper sealing procedures.

PART NUMBER	HOLE DIAMETER
W716284–S	0.859in. [21.83mm]
W714104–S	1.07in. [27.25mm]
W711539–S	1.378in.[35.0mm]
W651021–S	1.683 in. [42.75mm]

Tools For Creating A Circular Opening

Tools that can be used for creating and/or modifying an existing opening for a plug are a Knockout Punch or Step Bit.

Disable Police Functions

Procedures are under way to decommission the following Police Features:

- Police Idle
- Rear View Camera on Demand
- Perimeter Alert/Boundary Alert
- Procedures will be published in Police Bulletin P-030 when complete.

Dark Car
Authorized personnel must use a diagnostic scan tool to decommission the Dark Car feature.

OBD-II Split Connector
Remove the OBD-II split connector cable prior to initial sale to the public sector.

Police Engine Idle
Authorized personnel must use a diagnostic scan tool to decommission the Police Engine Idle feature.

Police Perimeter Alert
Authorized personnel must use a diagnostic scan tool to decommission the Police Perimeter Alert feature.

Pre-Collision Assist Disable
Authorized personnel must use a diagnostic scan tool to decommission the Pre-Collision Assist Disable feature.

Rear Camera on Demand
Authorized personnel must use a diagnostic scan tool to decommission the Rear Camera on Demand feature.

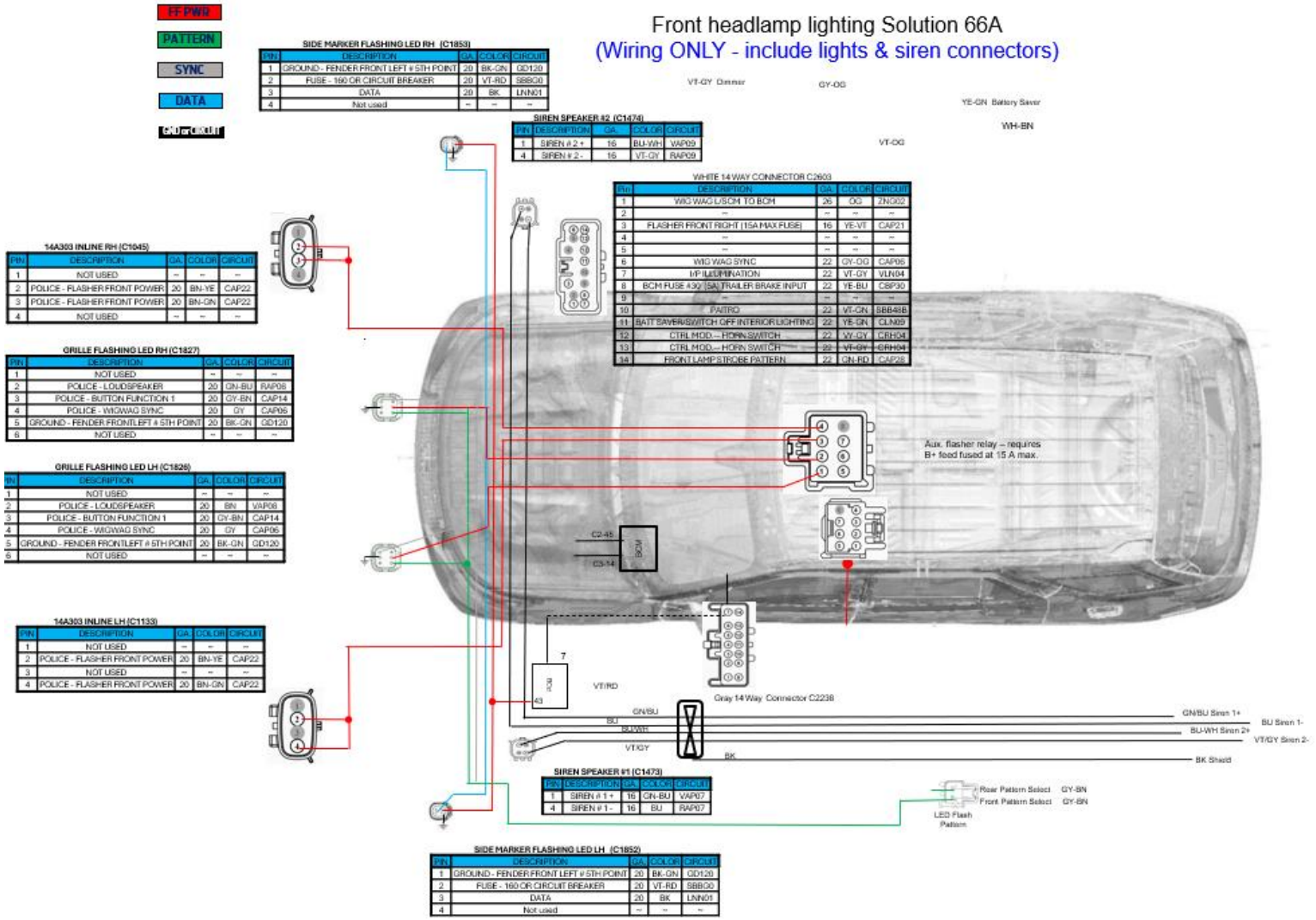
Autonomous Emergency Brake (AEB)
Authorized personnel must use a diagnostic scan tool to decommission the Autonomous Emergency Brake feature.

Ballistic Panel Removal – SPECIAL NOTE:
The front door latch has been modified for doors with factory installed ballistic panels. Upon ballistic panel removal, a new front door latch and remote-control assembly will be required. (Further details found in Section 5)

EQUIPMENT GROUPS

Front Headlamp Lighting Solution (Option Code: 66A)

- Includes LED Low beam/High beam headlamp, Wig-wag function and (2) Red/Blue/White LED
- side warning lights in each headlamp (factory configured: driver's side White/Red / passenger side White/Blue)
- Includes pre-wire for grille LED lights, siren and speaker.
- Wiring, LED lights included (in headlamps only; grille lights not included). Controller "not" included.


Front headlamp lighting Solution 66A
(Wiring ONLY - include lights & siren connectors)
FF PWR
PATTERN
SYNC
DATA
GROUND
SIDE MARKER FLASHING LED RH (C1853)
SIREN SPEAKER #2 (C1474)
WHITE 14 WAY CONNECTOR C2603
14A303 INLINE RH (C1045)
GRILLE FLASHING LED RH (C1827)
GRILLE FLASHING LED LH (C1826)
14A303 INLINE LH (C1133)
SIREN SPEAKER #1 (C1473)
SIDE MARKER FLASHING LED LH (C1852)
Aux. flasher relay – requires B+ feed fused at 15 A max.
Gray 14 Way Connector C2238
LED Flash Pattern

For detailed schematics, please visit: https://www.motorcraftservice.com/

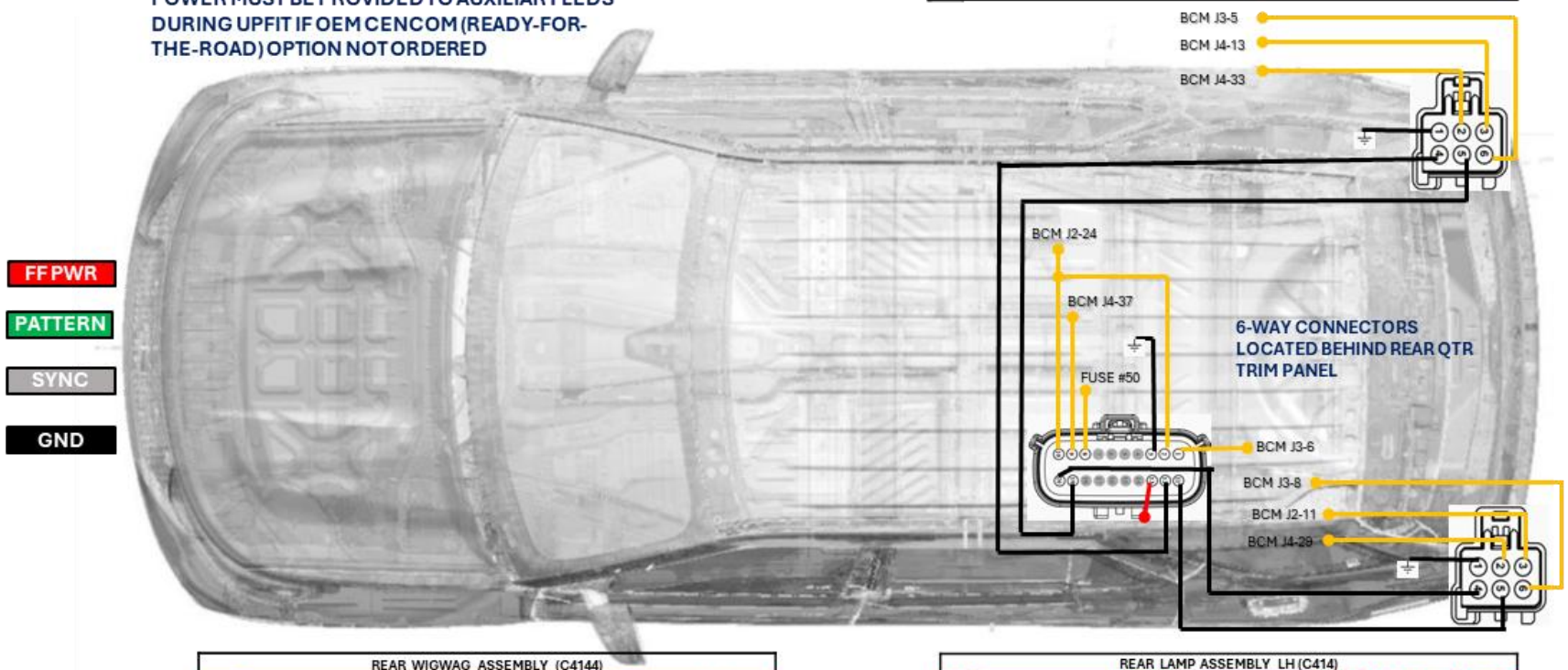
EQUIPMENT GROUPS *(Cont'd)*

Tail Lamp Lighting Solution (Option Code: 66B)

- Includes LED Tail Lamp Wig-Wag Module
- LED lights only. Wiring, controller "not" included.

For detailed schematics, please visit: https://www.motorcraftservice.com/

REAR LAMP ASSEMBLY RH (C417)				
PIN	DESCRIPTION	GA.	CKT. COLOR	CIRCUIT
1	GROUND - PILLAR D RIGHT # 2ND POINT	14	BK-GY	GD352
2	LAMP - TURN REAR RIGHT # SIGNAL OUT	22	BU-GN	CLS54
3	ECU - PARK FRONT RIGHT OR FRONT/REAR RIGHT	22	BN-GN	CLS07
4	ECU-POLICE # WIGWAG REVERSE RIGHT OR COMMON	22	GY	CAP56
5	ECU-POLICE # WIGWAG STOP/TURN RIGHT OUTBOARD	22	VT-WH	CAP58
6	ECU - TURN LAMP RIGHT REAR	22	GN	CLS27



REAR WIGWAG ASSEMBLY (C4144)				
PIN	DESCRIPTION	GA.	CKT. COLOR	CIRCUIT
1	ECU - BCM # STOP/TURN LEFT OUTBOARD	20	WH	CLS51
2	ECU - BCM # REVERSE LEFT OR COMMON	22	GN	CLS10
3	GROUND - PILLAR D LEFT	22	BK-BU	GD349
8	FUSE - 50	18	WH-VT	CBA50
9	ECU - BCM # STOP/TURN RIGHT OUTBOARD	20	GY-YE	CLS53
10	ECU - BCM # REVERSE LEFT OR COMMON	22	GN-BN	CLS10
11	ECU - POLICE # WIGWAG STOP/TURN LEFT	20	GN-WH	CAP57
12	ECU - POLICE # WIGWAG REVERSE RIGHT	22	GY	CAP56
13	POLICE - FLASHER REAR POWER	22	WH-GN	CAP23
19	ECU - POLICE # WIGWAG STOP/TURN RIGHT	20	VT-WH	CAP58
20	ECU - POLICE # WIGWAG REVERSE LEFT OR COMMON	22	YE-GN	CAP55

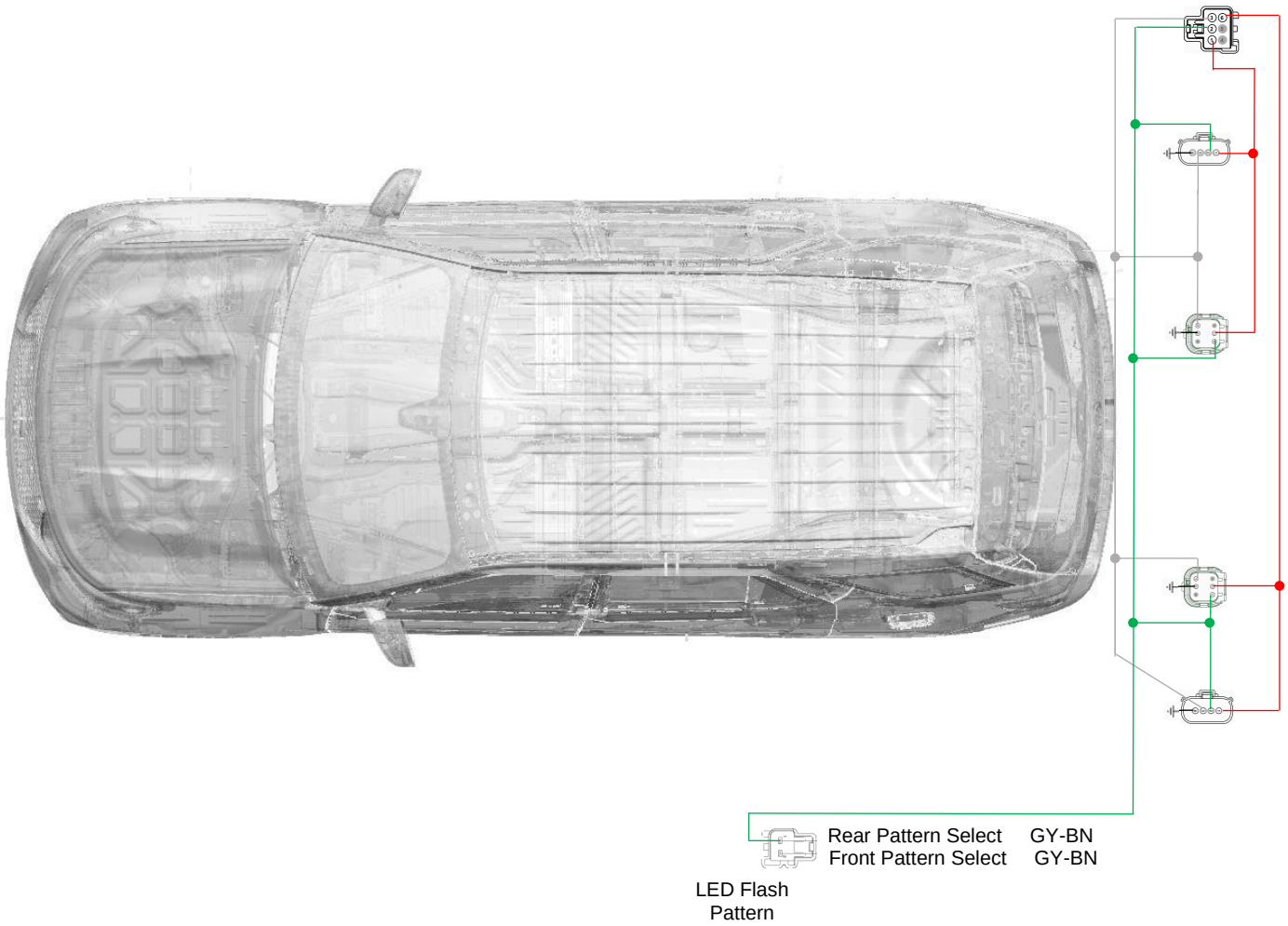
REAR LAMP ASSEMBLY LH (C414)				
PIN	DESCRIPTION	GA.	CKT. COLOR	CIRCUIT
1	GROUND - PILLAR D LEFT	14	BK-GY	GD349
2	LAMP - TURN REAR LEFT # SIGNAL OUT	22	GN	CLS55
3	ECU - PARK FRONT LEFT OR FRONT/REAR LEFT	22	GN-BU	CLS06
4	ECU - POLICE # WIGWAG REVERSE LEFT OR COMMON	22	YE-GN	CAP55
5	ECU - POLICE # WIGWAG STOP/TURN LEFT	22	GN-WH	CAP57
6	ECU - TURN LAMP LEFT REAR	22	GY	CLS23

APPLY POWER TO PIN 13 FROM THE 6-WAY (KEY IN RUN/START)

EQUIPMENT GROUPS *(Cont'd)*

Rear Lighting Solution (Option Code: 66C)

- Includes (2) backlit flashing, linear high-intensity LED lights (driver side red; passenger side blue) with surround cover mounted inside the liftgate glass.



DECKLID FLASHING LED

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	POLICE - FLASHER REAR	18	WH	CAP23
2	POLICE - LAMP STROBE PATTERN REAR	22	BN-GN	CAP29
3	POLICE - LAMP STROBE SYNC REAR	22	WH-GN	CAP27
4	NOT USED	~	~	~
5	NOT USED	~	~	~
6	POLICE - FLASHER REAR	18	WH	CAP23

DECKLID FLASHING LED RH (C4807)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	POLICE - FLASHER REAR	20	WH	CAP23
2	POLICE - LAMP STROBE PATTERN REAR	20	BN-BU	CAP29
3	POLICE - LAMP STROBE SYNC REAR	20	WH-BN	CAP27
4	GROUND - LIFTGATE/DECKLID LEFT	20	BK-WH	GD372

LIFTGATE FLASHING LED RH (C4812) (C4835)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - FLASHER REAR	20	WH	CAP23
3	POLICE - LAMP STROBE PATTERN REAR	20	BN-BU	CAP29
4	POLICE - LAMP STROBE SYNC REAR	20	WH-BN	CAP27
5	GROUND - LIFTGATE/DECKLID LEFT	20	BN-WH	GD372
6	NOT USED	~	~	~

DECKLID FLASHING LED LH (C4806)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	POLICE - FLASHER REAR	20	WH	CAP23
2	POLICE - LAMP STROBE PATTERN REAR	20	BN-GN	CAP29
3	POLICE - LAMP STROBE SYNC REAR	20	WH-GN	CAP27
4	GROUND - LIFTGATE/DECKLID LEFT	20	BK-WH	GD372

LIFTGATE FLASHING LED LH (C4811)

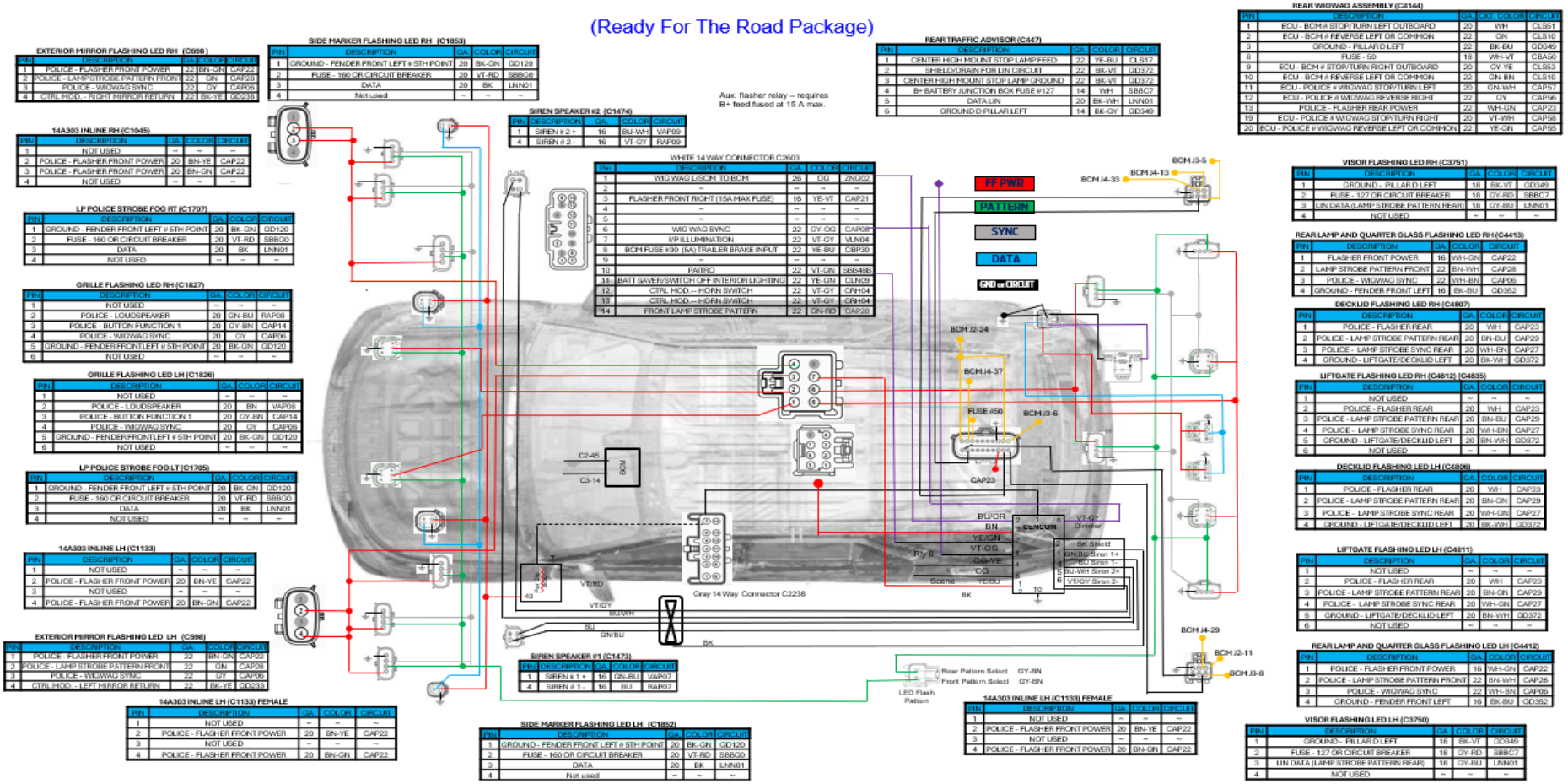
PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - FLASHER REAR	20	WH	CAP23
3	POLICE - LAMP STROBE PATTERN REAR	20	BN-GN	CAP29
4	POLICE - LAMP STROBE SYNC REAR	20	WH-GN	CAP27
5	GROUND - LIFTGATE/DECKLID LEFT	20	BN-WH	GD372
6	NOT USED	~	~	~

For detailed schematics, please visit: https://www.motorcraftservice.com/

EQUIPMENT GROUPS *(Cont'd)*

Ready for the Road Package (Option Code: 67H)

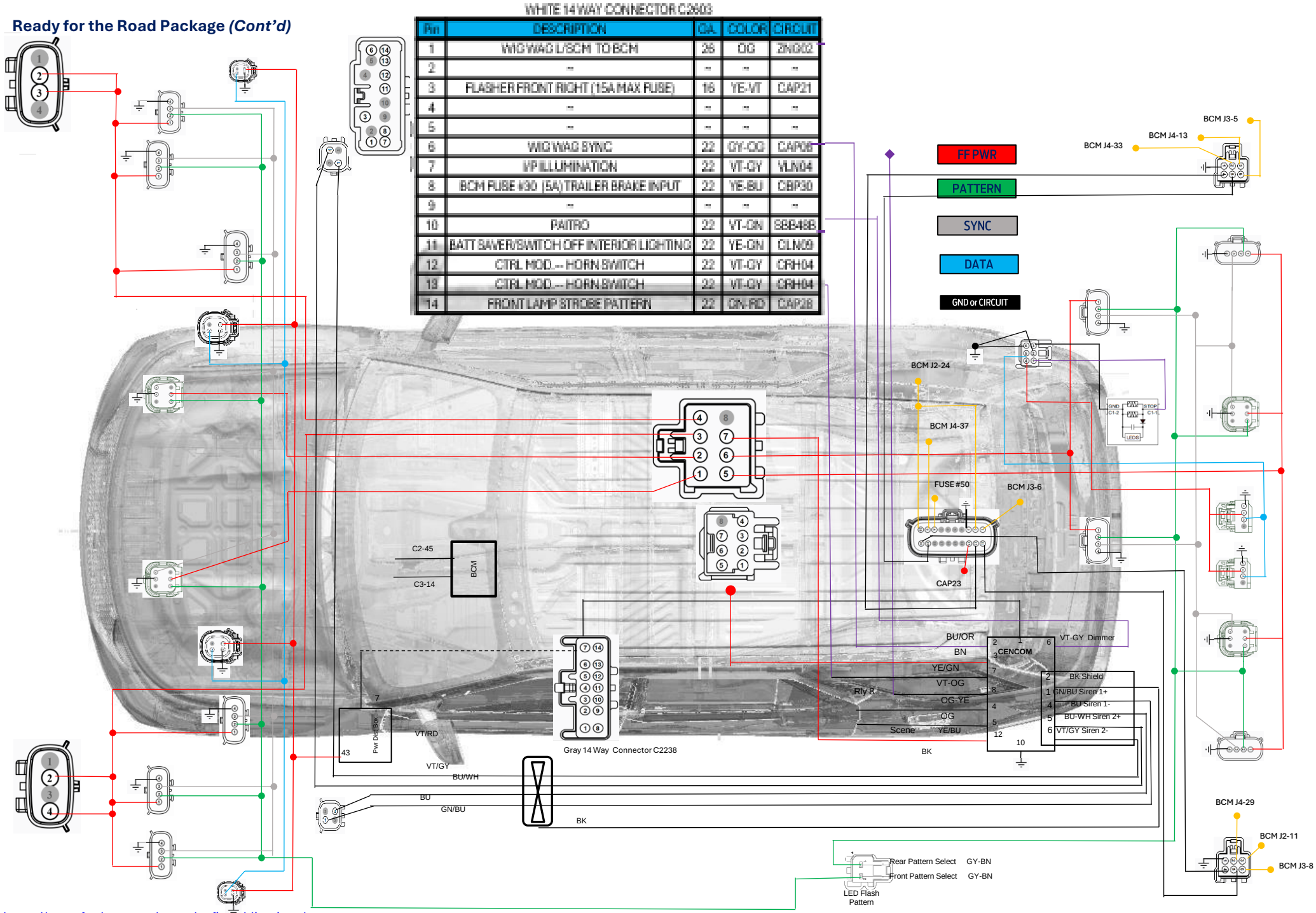
- All-in Complete Package – Includes Police Interceptor Packages: 66A, 66B, 66C, plus
- Whelen Cencom Light Controller Head with dimmable backlight
- Whelen Cencom Relay Center / Siren / Amp w/Traffic Advisor control (mounted behind 2nd row seat)
- Light Controller / Relay Cencom Wiring (wiring harness) w/additional input/output pigtails
- High current pigtail
- Whelen Specific WECAN Cable (console to cargo area) connects Cencom to Control Head
- Pre-wiring for grille LED lights, siren, and speaker
- Rear console plate (85R) – contours through 2nd row; channel for wiring
- Grille linear LED Lights (Red / Blue) and harness
- 100-Watt Siren / Speaker
- Hidden Door-Lock Plunger w/Rear-door controls inoperable (locks, handles and windows) (52P)


(Ready For The Road Package)
EXTERIOR MIRROR FLASHING LED RH (C698)
SIDE MARKER FLASHING LED RH (C1853)
REAR TRAFFIC ADVISOR (C447)
REAR W/O/W/A/O ASSEMBLY (C4144)
14A303 INLINE RH (C1045)
SIREN SPEAKER #2 (C1474)
Aux. flasher relay – requires B+ feed fused at 15 A max.
WHITE 14 WAY CONNECTOR C2603
VISOR FLASHING LED RH (C3751)
LP POLICE STROBE FOG RT (C1707)
REAR LAMP AND QUARTER GLASS FLASHING LED RH (C4413)
GRILLE FLASHING LED RH (C1827)
DECKLID FLASHING LED RH (C4807)
GRILLE FLASHING LED LH (C1826)
LIFTGATE FLASHING LED RH (C4812) (C4835)
LP POLICE STROBE FOG LT (C1705)
DECKLID FLASHING LED LH (C4826)
14A303 INLINE LH (C1133)
LIFTGATE FLASHING LED LH (C4811)
EXTERIOR MIRROR FLASHING LED LH (C698)
REAR LAMP AND QUARTER GLASS FLASHING LED LH (C4412)
14A303 INLINE LH (C1133) FEMALE
SIREN SPEAKER #1 (C1473)
SIDE MARKER FLASHING LED LH (C1852)
VISOR FLASHING LED LH (C3750)
FF PWR
PATTERN
SYNC
DATA
GND or DRLT
Gray 14 Way Connector C2238
Rear Pattern Select
Front Pattern Select
LED Flash Pattern

Ready for the Road Package *(Cont'd)*

WHITE 14 WAY CONNECTOR C2603

Pin	DESCRIPTION	GA.	COLOR	CIRCUIT
1	WIG WAG L/SCM TO BCM	20	OG	2WG02
2	--	--	--	--
3	FLASHER FRONT RIGHT (15A MAX FUSE)	16	YE-VT	CAP21
4	--	--	--	--
5	--	--	--	--
6	WIG WAG SYNC	22	GY-OG	CAP06
7	I/P ILLUMINATION	22	VT-GY	VLN04
8	BCM FUSE #30 (5A) TRAILER BRAKE INPUT	22	YE-BU	CBP30
9	--	--	--	--
10	PATRO	22	VT-GN	SBB48B
11	BATT SAVER/SWITCH OFF INTERIOR LIGHTING	22	YE-GN	CLN09
12	CTRL MOD -- HORN SWITCH	22	VT-GY	CRH04
13	CTRL MOD -- HORN SWITCH	22	VT-GY	CRH04
14	FRONT LAMP STROBE PATTERN	22	GN-RD	CAP28



POLICE MODIFIER GUIDE

SECTION 2 – GENERAL ELECTRICAL INFORMATION

Ready for the Road Package *(Cont'd)*

EXTERIOR MIRROR FLASHING LED RH (C698)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	POLICE - FLASHER FRONT POWER	22	BN-GN	CAP22
2	POLICE - LAMP STROBE PATTERN FRONT	22	GN	CAP28
3	POLICE - WIGWAG SYNC	22	GY	CAP06
4	CTRL MOD. - RIGHT MIRROR RETURN	22	BK-YE	GD238

14A303 INLINE RH (C1045)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - FLASHER FRONT POWER	20	BN-YE	CAP22
3	POLICE - FLASHER FRONT POWER	20	BN-GN	CAP22
4	NOT USED	~	~	~

LP POLICE STROBE FOG RT (C1707)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	GROUND - FENDER FRONT LEFT # 5TH POINT	20	BK-GN	GD120
2	FUSE - 160 OR CIRCUIT BREAKER	20	VT-RD	SBBG0
3	DATA	20	BK	LNN01
4	NOT USED	~	~	~

GRILLE FLASHING LED RH (C1827)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - LOUDSPEAKER	20	GN-BU	RAP08
3	POLICE - BUTTON FUNCTION 1	20	GY-BN	CAP14
4	POLICE - WIGWAG SYNC	20	GY	CAP06
5	GROUND - FENDER FRONTLEFT # 5TH POINT	20	BK-GN	GD120
6	NOT USED	~	~	~

GRILLE FLASHING LED LH (C1826)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - LOUDSPEAKER	20	BN	VAP08
3	POLICE - BUTTON FUNCTION 1	20	GY-BN	CAP14
4	POLICE - WIGWAG SYNC	20	GY	CAP06
5	GROUND - FENDER FRONTLEFT # 5TH POINT	20	BK-GN	GD120
6	NOT USED	~	~	~

LP POLICE STROBE FOG LT (C1705)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	GROUND - FENDER FRONT LEFT # 5TH POINT	20	BK-GN	GD120
2	FUSE - 160 OR CIRCUIT BREAKER	20	VT-RD	SBBG0
3	DATA	20	BK	LNN01
4	NOT USED	~	~	~

14A303 INLINE LH (C1133)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - FLASHER FRONT POWER	20	BN-YE	CAP22
3	NOT USED	~	~	~
4	POLICE - FLASHER FRONT POWER	20	BN-GN	CAP22

EXTERIOR MIRROR FLASHING LED LH (C598)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	POLICE - FLASHER FRONT POWER	22	BN-GN	CAP22
2	POLICE - LAMP STROBE PATTERN FRONT	22	GN	CAP28
3	POLICE - WIGWAG SYNC	22	GY	CAP06
4	CTRL MOD. - LEFT MIRROR RETURN	22	BK-YE	GD233

14A303 INLINE LH (C1133) FEMALE

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - FLASHER FRONT POWER	20	BN-YE	CAP22
3	NOT USED	~	~	~
4	POLICE - FLASHER FRONT POWER	20	BN-GN	CAP22

SIDE MARKER FLASHING LED RH (C1853)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	GROUND - FENDER FRONT LEFT # 5TH POINT	20	BK-GN	GD120
2	FUSE - 160 OR CIRCUIT BREAKER	20	VT-RD	SBBG0
3	DATA	20	BK	LNN01
4	Not used	~	~	~

SIREN SPEAKER #1 (C1473)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	SIREN # 1 +	16	GN-BU	VAP07
4	SIREN # 1 -	16	BU	RAP07

SIREN SPEAKER #2 (C1474)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	SIREN # 2 +	16	BU-WH	VAP09
4	SIREN # 2 -	16	VT-GY	RAP09

SIDE MARKER FLASHING LED LH (C1852)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	GROUND - FENDER FRONT LEFT # 5TH POINT	20	BK-GN	GD120
2	FUSE - 160 OR CIRCUIT BREAKER	20	VT-RD	SBBG0
3	DATA	20	BK	LNN01
4	Not used	~	~	~

REAR TRAFFIC ADVISOR (C447)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	CENTER HIGH MOUNT STOP LAMP FEED	22	YE-BU	CLS17
2	SHIELD/DRAIN FOR LIN CIRCUIT	22	BK-VT	GD372
3	CENTER HIGH MOUNT STOP LAMP GROUND	22	BK-VT	GD372
4	B+ BATTERY JUNCTION BOX FUSE #127	14	WH	SBBC7
5	DATA LIN	20	BK-WH	LNN01
6	GROUND D PILLAR LEFT	14	BK-GY	GD349

14A303 INLINE LH (C1133) FEMALE

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - FLASHER FRONT POWER	20	BN-YE	CAP22
3	NOT USED	~	~	~
4	POLICE - FLASHER FRONT POWER	20	BN-GN	CAP22

REAR WIGWAG ASSEMBLY (C4144)

PIN	DESCRIPTION	GA.	. COLOR	CIRCUIT
1	ECU - BCM # STOP/TURN LEFT OUTBOARD	20	WH	CLS51
2	ECU - BCM # REVERSE LEFT OR COMMON	22	GN	CLS10
3	GROUND - PILLAR D LEFT	22	BK-BU	GD349
8	FUSE - 50	18	WH-VT	CBA50
9	ECU - BCM # STOP/TURN RIGHT OUTBOARD	20	GY-YE	CLS53
10	ECU - BCM # REVERSE LEFT OR COMMON	22	GN-BN	CLS10
11	ECU - POLICE # WIGWAG STOP/TURN LEFT	20	GN-WH	CAP57
12	ECU - POLICE # WIGWAG REVERSE RIGHT	22	GY	CAP56
13	POLICE - FLASHER REAR POWER	22	WH-GN	CAP23
19	ECU - POLICE # WIGWAG STOP/TURN RIGHT	20	VT-WH	CAP58
20	ECU - POLICE # WIGWAG REVERSE LEFT OR COMMON	22	YE-GN	CAP55

VISOR FLASHING LED RH (C3751)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	GROUND - PILLAR D LEFT	18	BK-VT	GD349
2	FUSE - 127 OR CIRCUIT BREAKER	18	GY-RD	SBBC7
3	LIN DATA (LAMP STROBE PATTERN REAR)	18	GY-BU	LNN01
4	NOT USED	~	~	~

POLICE MODIFIER GUIDE

SECTION 2 – GENERAL ELECTRICAL INFORMATION

Ready for the Road Package *(Cont'd)*

REAR LAMP AND QUARTER GLASS FLASHING LED RH (C4413)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	FLASHER FRONT POWER	16	WH-GN	CAP22
2	LAMP STROBE PATTERN FRONT	22	BN-WH	CAP28
3	POLICE - WIGWAG SYNC	22	WH-BN	CAP06
4	GROUND - FENDER FRONT LEFT	16	BK-BU	GD352

DECKLID FLASHING LED RH (C4807)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	POLICE - FLASHER REAR	20	WH	CAP23
2	POLICE - LAMP STROBE PATTERN REAR	20	BN-BU	CAP29
3	POLICE - LAMP STROBE SYNC REAR	20	WH-BN	CAP27
4	GROUND - LIFTGATE/DECKLID LEFT	20	BK-WH	GD372

LIFTGATE FLASHING LED RH (C4812) (C4835)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - FLASHER REAR	20	WH	CAP23
3	POLICE - LAMP STROBE PATTERN REAR	20	BN-BU	CAP29
4	POLICE - LAMP STROBE SYNC REAR	20	WH-BN	CAP27
5	GROUND - LIFTGATE/DECKLID LEFT	20	BN-WH	GD372
6	NOT USED	~	~	~

DECKLID FLASHING LED LH (C4806)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	POLICE - FLASHER REAR	20	WH	CAP23
2	POLICE - LAMP STROBE PATTERN REAR	20	BN-GN	CAP29
3	POLICE - LAMP STROBE SYNC REAR	20	WH-GN	CAP27
4	GROUND - LIFTGATE/DECKLID LEFT	20	BK-WH	GD372

LIFTGATE FLASHING LED LH (C4811)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - FLASHER REAR	20	WH	CAP23
3	POLICE - LAMP STROBE PATTERN REAR	20	BN-GN	CAP29
4	POLICE - LAMP STROBE SYNC REAR	20	WH-GN	CAP27
5	GROUND - LIFTGATE/DECKLID LEFT	20	BN-WH	GD372
6	NOT USED	~	~	~

REAR LAMP AND QUARTER GLASS FLASHING LED LH (C4412)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	POLICE - FLASHER FRONT POWER	16	WH-GN	CAP22
2	POLICE - LAMP STROBE PATTERN FRONT	22	BN-WH	CAP28
3	POLICE - WIGWAG SYNC	22	WH-BN	CAP06
4	GROUND - FENDER FRONT LEFT	16	BK-BU	GD352

VISOR FLASHING LED LH (C3750)

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	GROUND - PILLAR D LEFT	18	BK-VT	GD349
2	FUSE - 127 OR CIRCUIT BREAKER	18	GY-RD	SBBC7
3	LIN DATA (LAMP STROBE PATTERN REAR)	18	GY-BU	LNN01
4	NOT USED	~	~	~

EQUIPMENT GROUPS *(Cont'd)*

Ultimate Wiring Package (Option Code: 67U)

- Rear console mounting plate (85R) – contours through 2nd row; channel for wiring
- Pre-wiring for grille LED lights, siren and speaker
- Wiring harness, I/P to rear cargo area (overlay)
- Two (2) light cables – supports up to six (6) LED lights (engine compartment/grille)
- One (1) 10-amp siren/speaker circuit engine compartment
- Rear hatch/cargo area wiring – supports up to six (6) rear LED lights.
- Does "not" include LED lights, side connectors or controller.

Ultimate Wiring Package – Reference image.

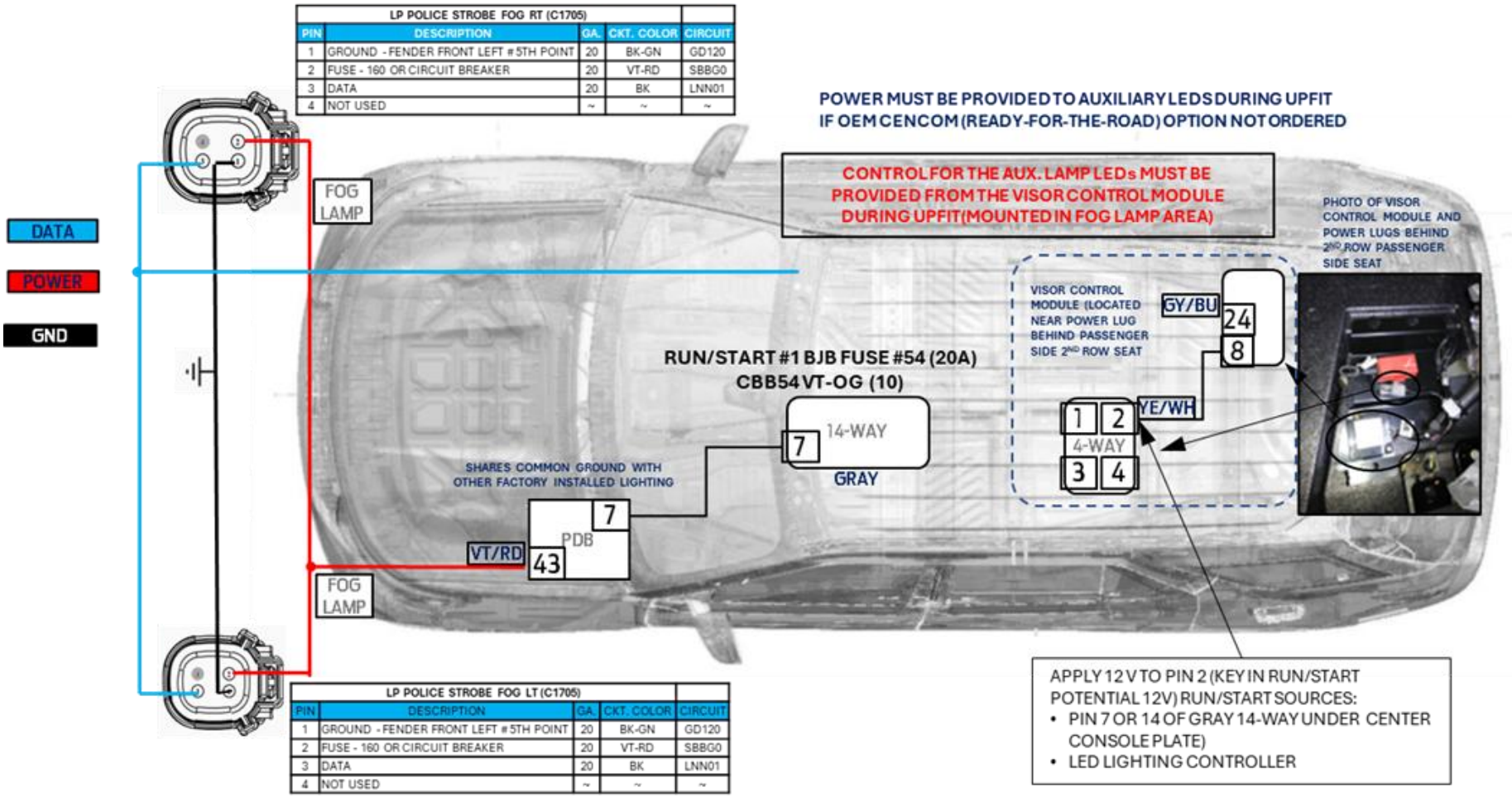
Police Wire Harness Connector Kit – Front/Rear (Option Code: 67V)

For connectivity to Ford PI Package solutions includes:

- Front
  - (2) Male 4-pin connectors for siren
  - (5) Female 4-pin connectors for lighting/siren/speaker
  - (1) 4-pin IP connector for speakers
  - (1) 4-pin IP connector for siren controller connectivity
  - (1) 8-pin sealed connector
  - (1) 14-pin IP connector
- Rear
  - (2) Male 4-pin connectors for siren
  - (5) Female 4-pin connectors for lighting/siren/speaker
  - (1) 4-pin IP connector for speakers
  - (1) 4-pin IP connector for siren controller connectivity
  - (1) 8-pin sealed connector
  - (1) 14-pin IP connector

KEY EXTERIOR OPTIONS

Front Warning Auxiliary LED Lights (Driver side – Red / Passenger side – Blue) (Option Code: 21L)


LP POLICE STROBE FOG RT (C1705)
PIN | DESCRIPTION | GA. | CKT. COLOR | CIRCUIT
1 | GROUND - FENDER FRONT LEFT #5TH POINT | 20 | BK-GN | GD120
2 | FUSE - 160 OR CIRCUIT BREAKER | 20 | VT-RD | SBBG0
3 | DATA | 20 | BK | LNN01
4 | NOT USED | ~ | ~ | ~
POWER MUST BE PROVIDED TO AUXILIARY LEDS DURING UPFIT
IF OEM CENCOM (READY-FOR-THE-ROAD) OPTION NOT ORDERED
CONTROL FOR THE AUX. LAMP LEDs MUST BE PROVIDED FROM THE VISOR CONTROL MODULE DURING UPFIT (MOUNTED IN FOG LAMP AREA)
PHOTO OF VISOR CONTROL MODULE AND POWER LUGS BEHIND 2ND ROW PASSENGER SIDE SEAT
DATA
POWER
GND
FOG LAMP
FOG LAMP
VISOR CONTROL MODULE (LOCATED NEAR POWER LUG BEHIND PASSENGER SIDE 2ND ROW SEAT
GY/BU
24
8
YE/WH
1
2
4-WAY
3
4
RUN/START #1 BJB FUSE #54 (20A)
CBB54 VT-OG (10)
14-WAY
7
GRAY
SHARES COMMON GROUND WITH OTHER FACTORY INSTALLED LIGHTING
PDB
7
VT/RD
43
APPLY 12 V TO PIN 2 (KEY IN RUN/START POTENTIAL 12V) RUN/START SOURCES:
• PIN 7 OR 14 OF GRAY 14-WAY UNDER CENTER CONSOLE PLATE)
• LED LIGHTING CONTROLLER
LP POLICE STROBE FOG LT (C1705)
PIN | DESCRIPTION | GA. | CKT. COLOR | CIRCUIT
1 | GROUND - FENDER FRONT LEFT #5TH POINT | 20 | BK-GN | GD120
2 | FUSE - 160 OR CIRCUIT BREAKER | 20 | VT-RD | SBBG0
3 | DATA | 20 | BK | LNN01
4 | NOT USED | ~ | ~ | ~

For detailed schematics, please visit: https://www.motorcraftservice.com/

KEY EXTERIOR OPTIONS (Cont'd)

Rear Auxiliary Liftgate Lights (Red/Blue LED Lights; located beneath liftgate glass in applique panel) (Option Code: 43A)

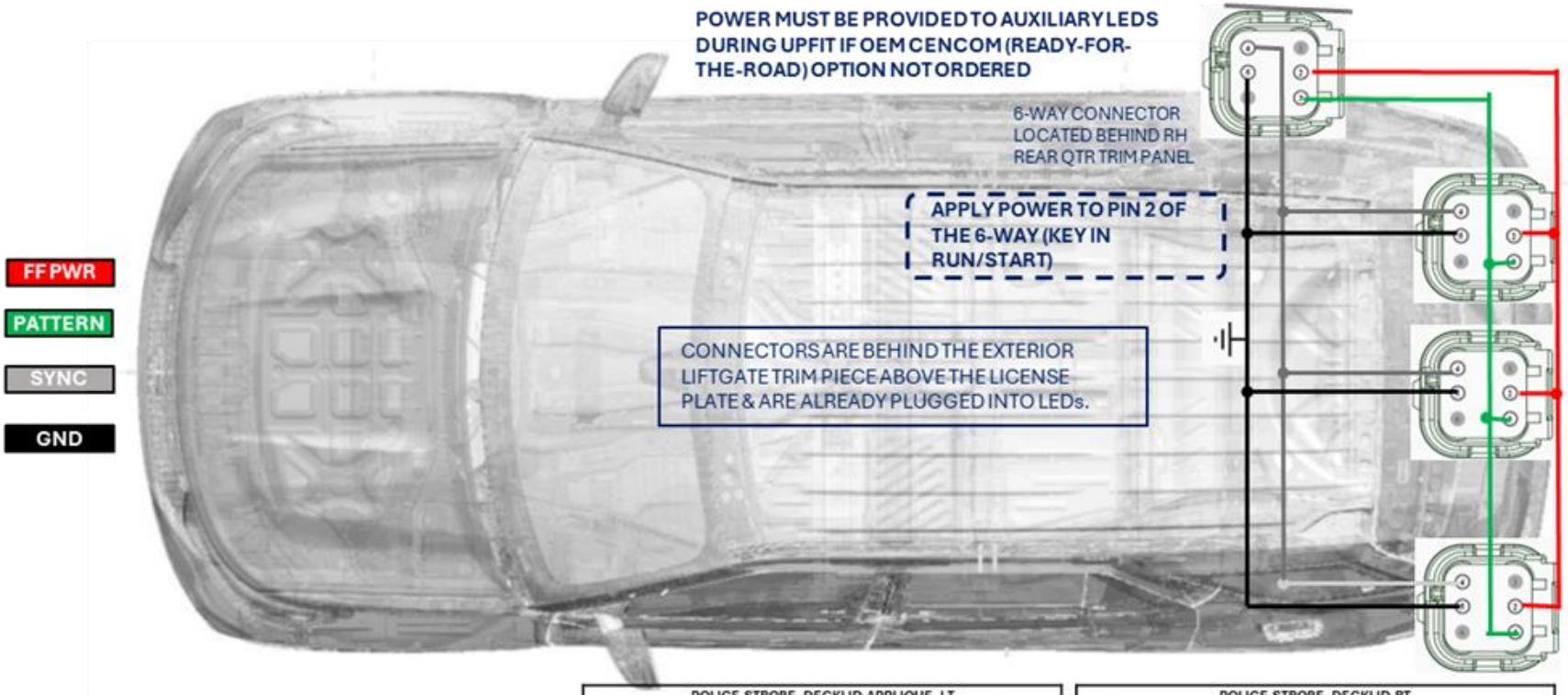
- LED lights only. Wiring, controller "not" included.

6-way connector located behind liftgate trim on passenger side of liftgate. Should be hanked up via tear tape to applique harness.

Apply Power to pin 2 of 6-way (key in run/start). Pin 5 of 6-way must be grounded.

LIFTGATE FLASHING LED RH (C4812) (C4835)				
PIN	DESCRIPTION	GA.	CKT. COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - FLASHER REAR	20	WH	CAP23
3	POLICE - LAMP STROBE PATTERN REAR	20	BN-BU	CAP29
4	POLICE - LAMP STROBE SYNC REAR	20	WH-BN	CAP27
5	GROUND - LIFTGATE/DECKLID LEFT	20	BN-WH	GD372
6	NOT USED	~	~	~

STROBE DECKLID APPLIQUE RT				
PIN	DESCRIPTION	GA.	CKT. COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - FLASHER REAR	20	WH	CAP23
3	POLICE - LAMP STROBE PATTERN REAR	20	BN-BU	CAP29
4	POLICE - LAMP STROBE SYNC REAR	20	WH-BN	CAP27
5	GROUND - LIFTGATE/DECKLID LEFT	20	BN-WH	GD372
6	NOT USED	~	~	~


POWER MUST BE PROVIDED TO AUXILIARY LEDS DURING UPFIT IF OEM CENCOM (READY-FOR-THE-ROAD) OPTION NOT ORDERED
6-WAY CONNECTOR LOCATED BEHIND RH REAR QTR TRIM PANEL
APPLY POWER TO PIN 2 OF THE 6-WAY (KEY IN RUN/START)
CONNECTORS ARE BEHIND THE EXTERIOR LIFTGATE TRIM PIECE ABOVE THE LICENSE PLATE & ARE ALREADY PLUGGED INTO LEDs.
FF PWR
PATTERN
SYNC
GND

POLICE STROBE DECKLID APPLIQUE LT				
PIN	DESCRIPTION	GA.	CKT. COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - FLASHER REAR	20	WH	CAP23
3	POLICE - LAMP STROBE PATTERN REAR	20	BN-BU	CAP29
4	POLICE - LAMP STROBE SYNC REAR	20	WH-BN	CAP27
5	GROUND - LIFTGATE/DECKLID LEFT	20	BN-WH	GD372
6	NOT USED	~	~	~

POLICE STROBE DECKLID RT				
PIN	DESCRIPTION	GA.	CKT. COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - FLASHER REAR	20	WH	CAP23
3	POLICE - LAMP STROBE PATTERN REAR	20	BN-BU	CAP29
4	POLICE - LAMP STROBE SYNC REAR	20	WH-BN	CAP27
5	GROUND - LIFTGATE/DECKLID LEFT	20	BN-WH	GD372
6	NOT USED	~	~	~

For detailed schematics, please visit: https://www.motorcraftservice.com/

KEY EXTERIOR OPTIONS (Cont'd)

Rear Quarter Glass Side Marker LED Lights (Driver side – Red / Passenger side – Blue) (Option Code: 63L)

- LED lights only. Wiring, controller "not" included.

Power must be provided to rear qtr. window LEDs during upfit.

Power must be provided to auxiliary LEDs during upfit if OEM Cencom (ready-for-the-road) option not ordered.

Ground pin 4, Apply 12 volts to pin 1

REAR QTR WINDOW LEDs CONNECTOR LOCATED BEHIND RH REAR CARGO TRIM PANEL NEAR TAIL LAMP HOUSING

QUARTER GLASS FLASHING LED RH (C4417)

PIN	DESCRIPTION	GA.	CKT. COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - FLASHER REAR	20	WH-GN	CAP23
3	GROUND SYNC OR LOW POWER	20	GN	~
4	NOT USED	~	~	~
5	GROUND - PILLAR D RIGHT # 2ND POINT	20	BK-VT	GD372
6	NOT USED	~	~	~

REAR LAMP AND QUARTER GLASS FLASHING LED RH)

PIN	DESCRIPTION	GA.	CKT. COLOR	CIRCUIT
1	POLICE - FLASHER FRONT POWER	16	WH-GN	CAP22
2	POLICE - LAMP STROBE PATTERN FRONT	22	BN-WH	CAP28
3	POLICE - WIGWAG SYNC	22	WH-BN	CAP06
4	GROUND - FENDER FRONT LEFT	16	BK-BU	GD352

REAR QTR WINDOW LED
FF PWR
PATTERN
SYNC
GND
4-WAY CONNECTOR BEHIND RH QTR TRIM PANEL FOR PASSENGER SIDE WINDOW. (SIMILAR FOR DRIVER SIDE)
GROUND SYNC OR LOW POWER BLUNT CUT CIRCUIT (GN) IS STOWED IN WIRE BUNDLE
REAR QTR WINDOW LED

REAR QTR WINDOW LEDs CONNECTOR LOCATED BEHIND LH REAR CARGO TRIM PANEL NEAR TAIL LAMP HOUSING

QUARTER GLASS FLASHING LED LH (C4416)

PIN	DESCRIPTION	GA.	CKT. COLOR	CIRCUIT
1	NOT USED	~	~	~
2	POLICE - FLASHER REAR	20	WH-GN	CAP23
3	GROUND SYNC OR LOW POWER	20	GN	~
4	NOT USED	~	~	~
5	GROUND - PILLAR D RIGHT # 2ND POINT	20	BK-VT	GD372
6	NOT USED	~	~	~

REAR LAMP AND QUARTER GLASS FLASHING LED LH

PIN	DESCRIPTION	GA.	CKT. COLOR	CIRCUIT
1	POLICE - FLASHER FRONT POWER	16	WH-GN	CAP22
2	POLICE - LAMP STROBE PATTERN FRONT	22	BN-WH	CAP28
3	POLICE - WIGWAG SYNC	22	WH-BN	CAP06
4	GROUND - FENDER FRONT LEFT	16	BK-BU	GD352

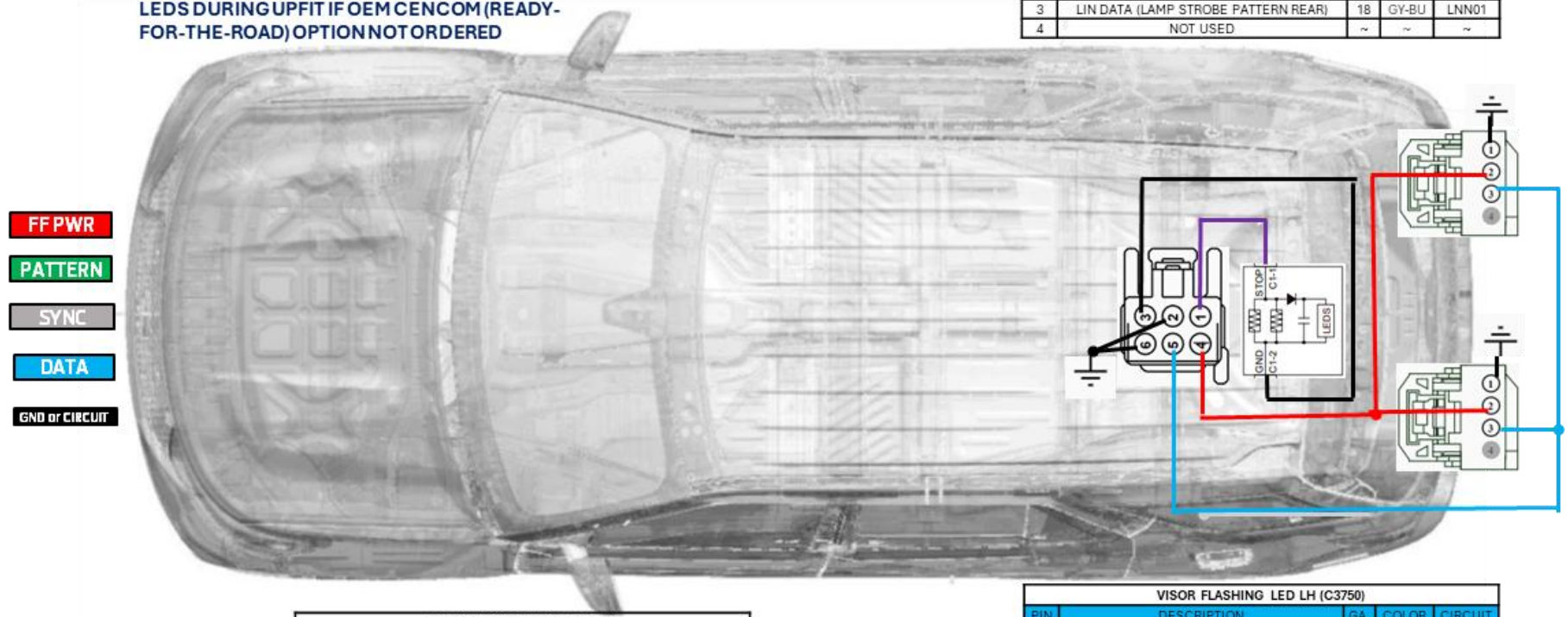
For detailed schematics, please visit: https://www.motorcraftservice.com/

KEY EXTERIOR OPTIONS (Cont'd)

Rear Spoiler Traffic Warning Lights (LED) (Option Code: 96T)

- Fully integrated in rear spoiler for enhanced visibility
- Provides red/blue/amber directional lighting – fully programmable.

POWER MUST BE PROVIDED TO AUXILIARY LEDS DURING UPFIT IF OEM CENCOM (READY-FOR-THE-ROAD) OPTION NOT ORDERED



VISOR FLASHING LED RH (C3751)				
PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	GROUND - PILLAR D LEFT	18	BK-VT	GD349
2	FUSE - 127 OR CIRCUIT BREAKER	18	GY-RD	SBBC7
3	LIN DATA (LAMP STROBE PATTERN REAR)	18	GY-BU	LNN01
4	NOT USED	~	~	~

REAR TRAFFIC ADVISOR (C447)				
PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	CENTER HIGH MOUNT STOP LAMP FEED	22	YE-BU	CLS17
2	SHIELD/DRAIN FOR LIN CIRCUIT	22	BK-VT	GD372
3	CENTER HIGH MOUNT STOP LAMP GROUND	22	BK-VT	GD372
4	B+ BATTERY JUNCTION BOX FUSE #127	14	WH	SBBC7
5	DATA LIN	20	BK-WH	LNN01
6	GROUND D PILLAR LEFT	14	BK-GY	GD349

PIN 4 POWERED BY BJB FUSE # 127

VISOR FLASHING LED LH (C3750)				
PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	GROUND - PILLAR D LEFT	18	BK-VT	GD349
2	FUSE - 127 OR CIRCUIT BREAKER	18	GY-RD	SBBC7
3	LIN DATA (LAMP STROBE PATTERN REAR)	18	GY-BU	LNN01
4	NOT USED	~	~	~

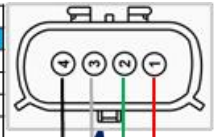
For detailed schematics, please visit: https://www.motorcraftservice.com/

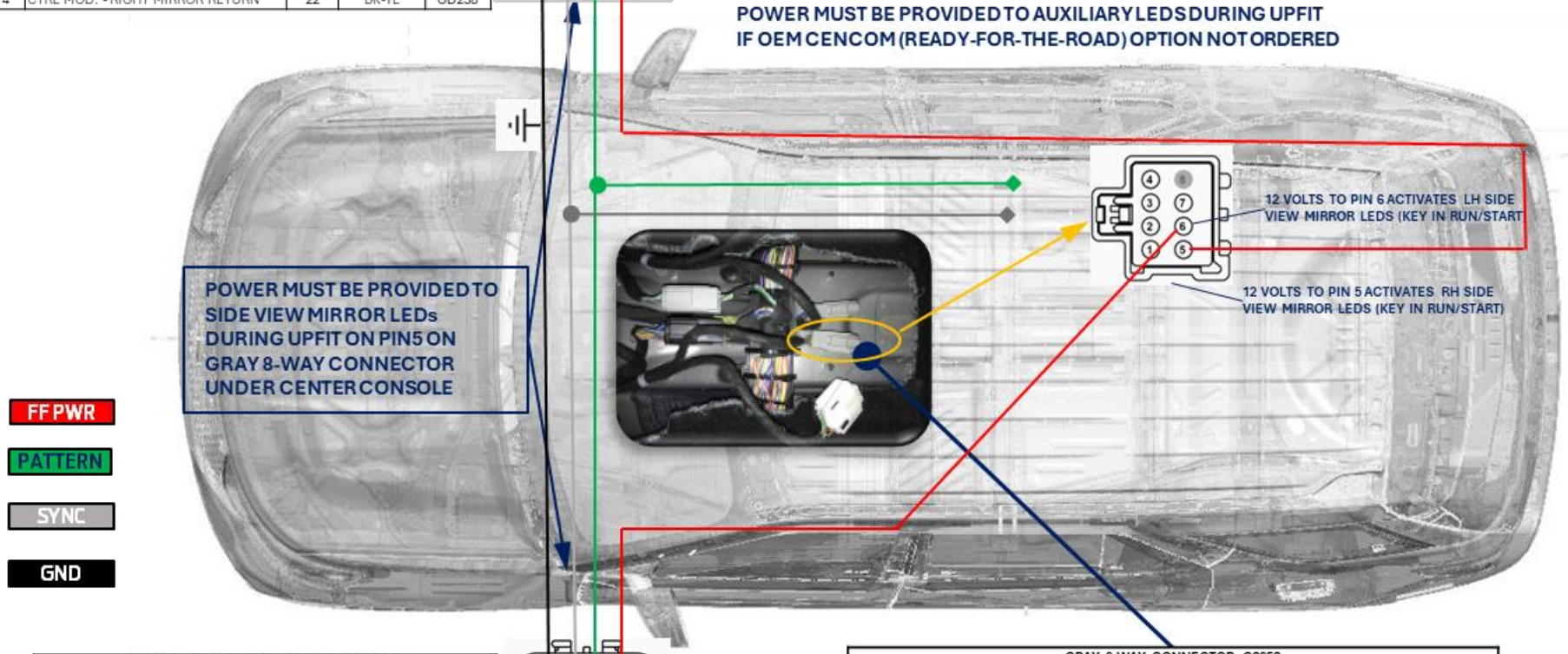
KEY EXTERIOR OPTIONS (Cont'd)

Side Marker LED – Sideview Mirrors (Driver side – Red / Passenger side – Blue) (Option Code: 63B)

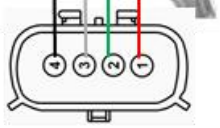
- Located on exterior mirror housing.
- LED lights only. Wiring, controller "not" included.

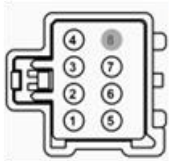
EXTERIOR MIRROR FLASHING LED RH (C698)				
PIN	DESCRIPTION	GA.	CKT COLOR	CIRCUIT
1	POLICE - FLASHER FRONT POWER	22	BN-GN	CAP22
2	POLICE - LAMP STROBE PATTERN FRONT	22	GN	CAP28
3	POLICE - WIGWAG SYNC	22	GY	CAP06
4	CTRL MOD. - RIGHT MIRROR RETURN	22	BK-YE	GD238




POWER MUST BE PROVIDED TO AUXILIARY LEDS DURING UPFIT
IF OEM CENCOM (READY-FOR-THE-ROAD) OPTION NOT ORDERED
12 VOLTS TO PIN 6 ACTIVATES LH SIDE VIEW MIRROR LEDS (KEY IN RUN/START
12 VOLTS TO PIN 5 ACTIVATES RH SIDE VIEW MIRROR LEDS (KEY IN RUN/START)
POWER MUST BE PROVIDED TO SIDE VIEW MIRROR LEDs DURING UPFIT ON PIN5 ON GRAY 8-WAY CONNECTOR UNDER CENTER CONSOLE
FF PWR
PATTERN
SYNC
GND

EXTERIOR MIRROR FLASHING LED LH (C598)				
PIN	DESCRIPTION	GA.	CKT COLOR	CIRCUIT
1	POLICE - FLASHER FRONT POWER	22	BN-GN	CAP22
2	POLICE - LAMP STROBE PATTERN FRONT	22	GN	CAP28
3	POLICE - WIGWAG SYNC	22	GY	CAP06
4	CTRL MOD. - LEFT MIRROR RETURN	22	BK-YE	GD233





GRAY 8-WAY CONNECTOR C3853 PINS 1-7 ARE INTERCONNECTED				
PIN	DESCRIPTION	GA.	WIRE COLOR	CIRCUIT
1	VPWR FROM CENTCOM RELAY	.50	BN	VAP08
2	VPWR FROM CENTCOM RELAY	.50	GN-BU	RAP08
3	VPWR FROM CENTCOM RELAY	.50	BN-YE	CAP22
4	VPWR FROM CENTCOM RELAY	.50	BN-BU	CAP22
5	VPWR FROM CENTCOM RELAY	.50	BN-RD	CAP22
6	VPWR FROM CENTCOM RELAY	.50	BN-WH	CAP22
7	VPWR FLASHER (LIGHTING/SIREN MODULE)	.35	YE-BU	CAP51A
8	~	~	~	~

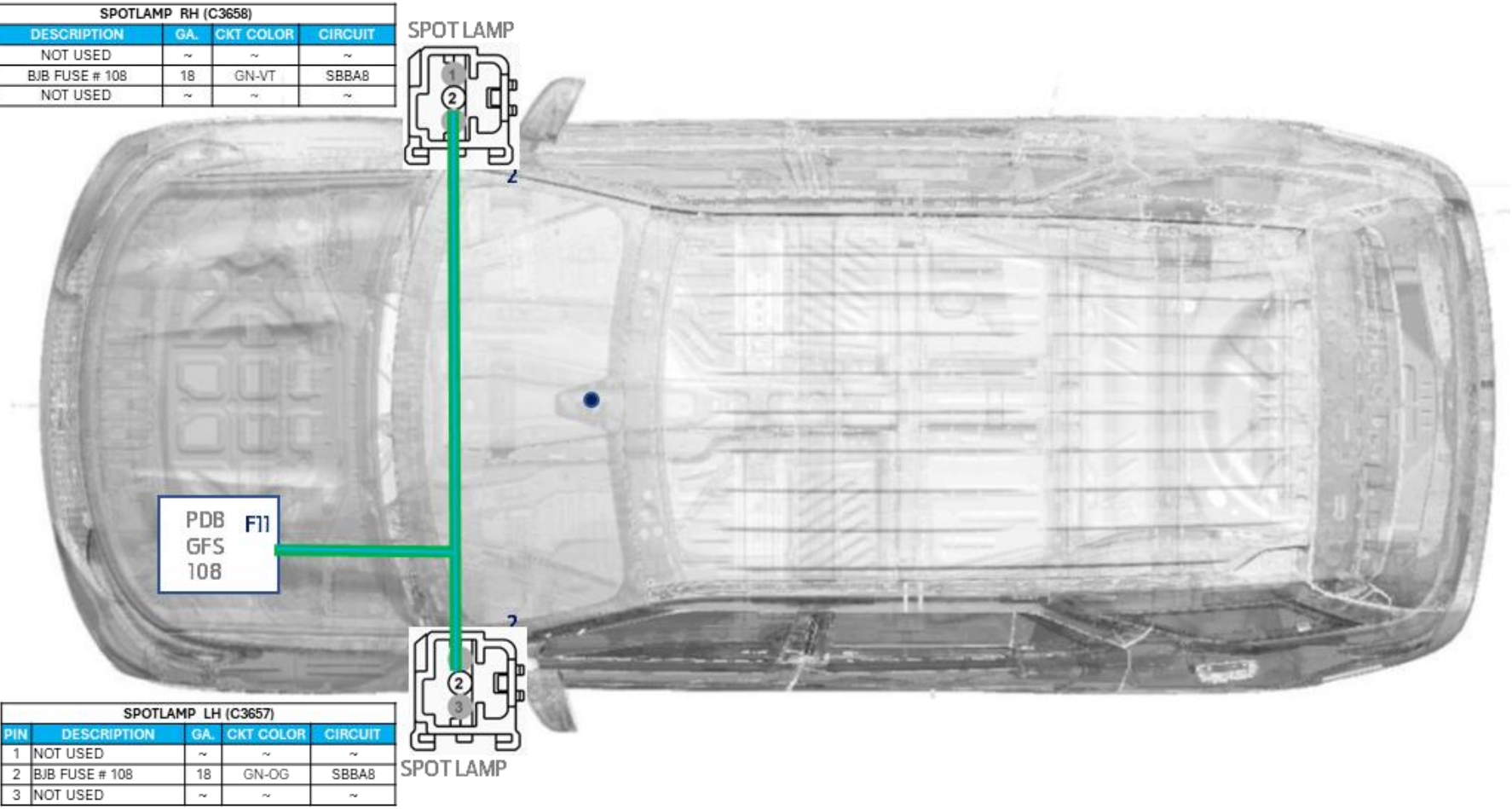
For detailed schematics, please visit: https://www.motorcraftservice.com/

KEY EXTERIOR OPTIONS (Cont'd)

Spot Lamp Prep Kits (Option Code: 51P & 51W)

- Spot Lamp Prep Kit, Driver Only (51P)
- Spot Lamp Prep Kit, Dual Driver and Passenger (51W)

SPOTLAMP RH (C3658)				
PIN	DESCRIPTION	GA.	CKT COLOR	CIRCUIT
1	NOT USED	~	~	~
2	BJB FUSE # 108	18	GN-VT	SBBA8
3	NOT USED	~	~	~

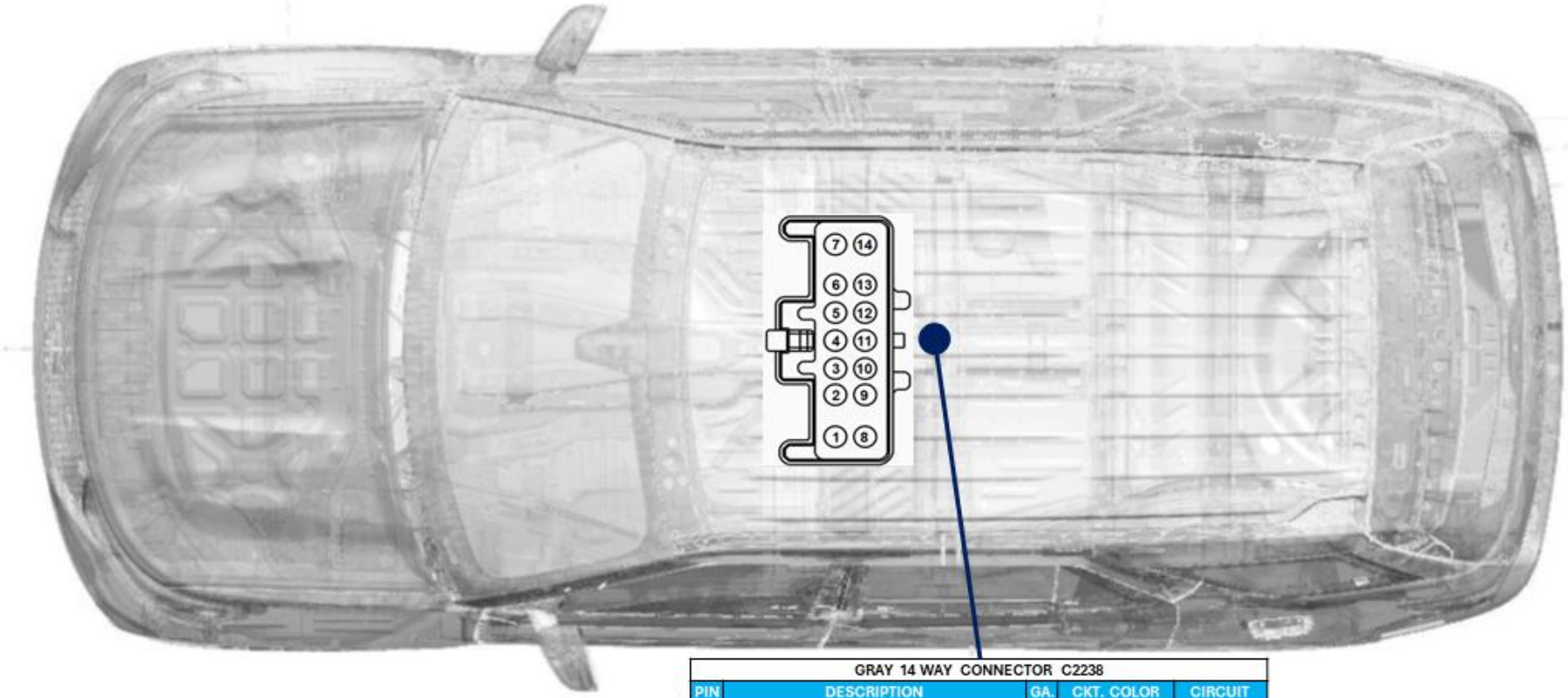


SPOTLAMP LH (C3657)				
PIN	DESCRIPTION	GA.	CKT COLOR	CIRCUIT
1	NOT USED	~	~	~
2	BJB FUSE # 108	18	GN-OG	SBBA8
3	NOT USED	~	~	~

For detailed schematics, please visit: https://www.motorcraftservice.com/

KEY EXTERIOR OPTIONS (Cont'd)

Park Detect & Police Start



GRAY 14 WAY CONNECTOR C2238				
PIN	DESCRIPTION	GA.	CKT. COLOR	CIRCUIT
1	B+ FEED BJB FUSE #127 (20A)	16	WH-RD	SBBC7
2	CONTROL BUTTON 1	22	GY-BN	CAP14
3	CONTROL BUTTON 2	22	WH-VT	CAP15
4	CONTROL BUTTON 3	22	GN-BN	CAP16
5	CONTROL BUTTON 4	22	YE-GY	CAP17
6	POLICE START BJB FUSE #116 (5A) INPUT	22	BU-BN	CBBB6
7	RUN/START #1 BJB FUSE #54 (20A)	10	VT-OG	CBB54
8	B+ FEED #2 BJB FUSE #115 (20A)	12	BU-RD	SBBB5
9	VEHICLE SPEED	22	VT-GN	VC05
10	DELAY ACCESSORY BJB FUSE 134 (10A)	22	VT-GY	CDC40
11	B+ FEED #3 BJB FUSE #160 (10A)	22	VT-RD	SBBG0
12	PARK DETECT	22	GN + BU	CET52
13	DRIVER DOOR AJAR	22	GN-OG	CPL26
14	RUN/START #2 BJB FUSE #118 (30A)	16	GY-BU	CBBB8

For detailed schematics, please visit: https://www.motorcraftservice.com/

KEY EXTERIOR OPTIONS (Cont'd)

Driver Door Ajar – Method 1 Using VIS

The Vehicle Integration System 2.0 can be programmed to output a low side or a high side signal to eliminate the use of a relay as shown on the next slide

- Driver door ajar signal is available via Vehicle Integration System 2.0 Connector 2 Pin 11
- WAC67A

NOTE: Can also be configured similarly for passenger door (2-Man Units)

For detailed schematics, please visit: https://www.motorcraftservice.com/

KEY EXTERIOR OPTIONS (Cont'd)

Driver Door Ajar – Method 2 Use Of Relay

POLICE MODIFIER BULLETIN P-032
(https://api.pd01e.gcp.ford.com/pro/bbas/download/PMB/654dc531bd2cfc7167ebcc92)
2020MY and beyond Police Interceptor Utility Driver's Door Ajar Circuit

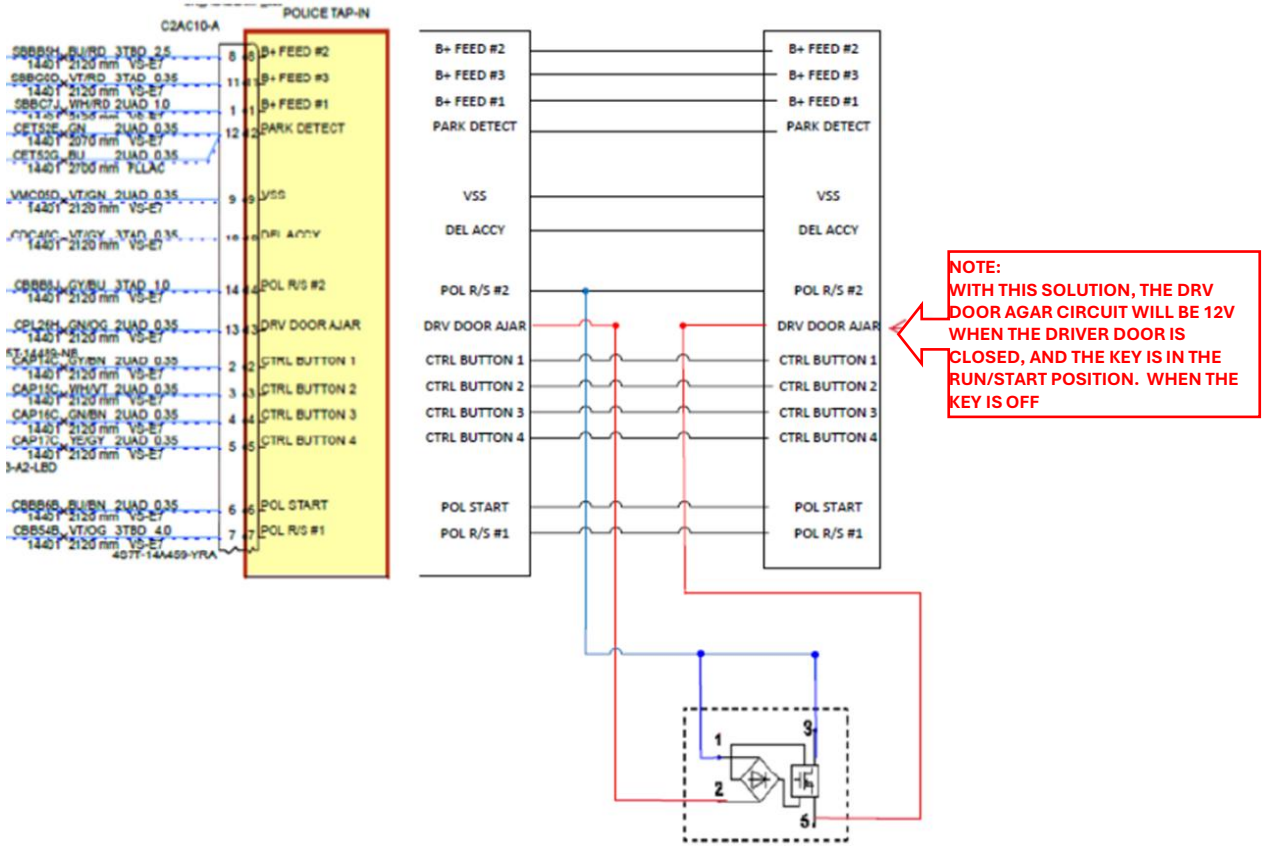
- Models Affected: 2020MY and beyond Police Interceptors Utilities

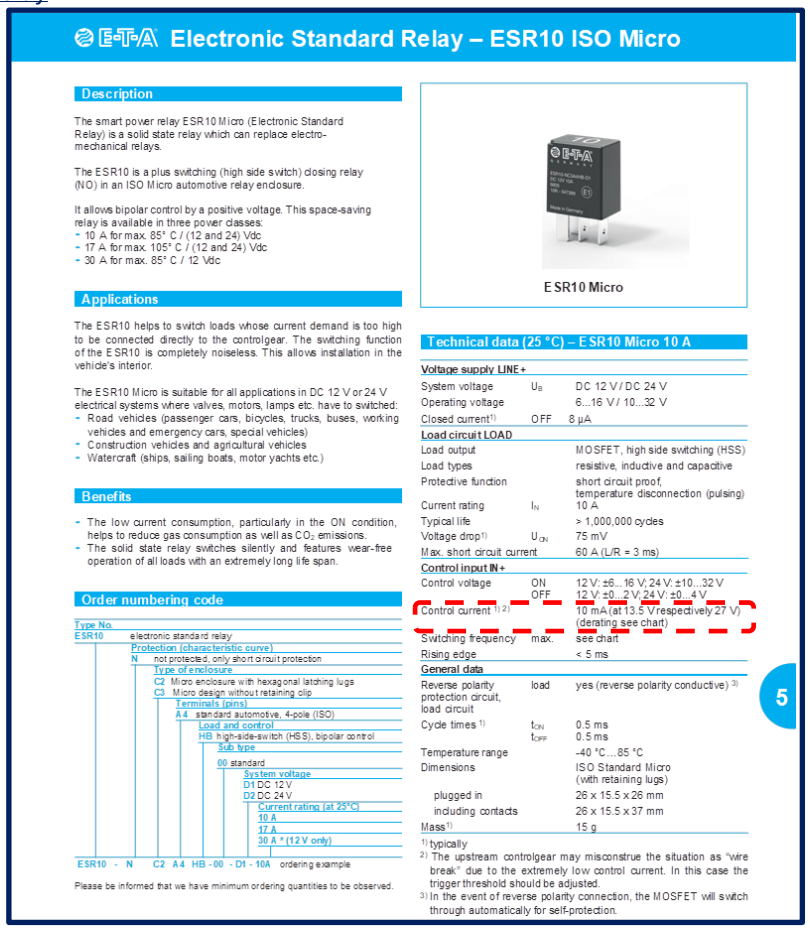
Purpose:
To provide information regarding access to the driver's door ajar circuit on 2020MY and beyond Police Interceptors Utility vehicles.

When using pin 13 on the factory 14-way connector to access the driver's door ajar circuit, a 70-mA maximum coil current relay with an integrated clamping diode is required to protect against damage to the door latch.

An example of this would be ETA solid state Electronic Standard Relay ESR 10 Iso Micro Solid State Automotive Relay.

GRAY 14-WAY CONNECTOR C2238				
PIN	DESCRIPTION	GA.	CKT. COLOR	CIRCUIT
1	B+ FEED BJB FUSE #127 (20A)	16	WH-RD	SBBC7
2	CONTROL BUTTON 1	22	GY-BN	CAP14
3	CONTROL BUTTON 2	22	WH-VT	CAP15
4	CONTROL BUTTON 3	22	GN-BN	CAP16
5	CONTROL BUTTON 4	22	YE-GY	CAP17
6	POLICE START BJB FUSE #116 (5A) INPUT	22	BU-BN	CBBB6
7	RUN/START #1 BJB FUSE #54 (20A)	10	VT-OG	CBB54
8	B+ FEED #2 BJB FUSE #115 (20A)	12	BU-RD	SBBB5
9	VEHICLE SPEED	22	VT-GN	VC05
10	DELAY ACCESSORY BJB FUSE 134 (10A)	22	VT-GY	CDC40
11	B+ FEED #3 BJB FUSE #160 (10A)	22	VT-RD	SBBG0
12	PARK DETECT	22	GN + BU	CET52
13	DRIVER DOOR AJAR	22	GN-OG	CPL26
14	RUN/START #2 BJB FUSE #118 (30A)	16	GY-BU	CBBB8

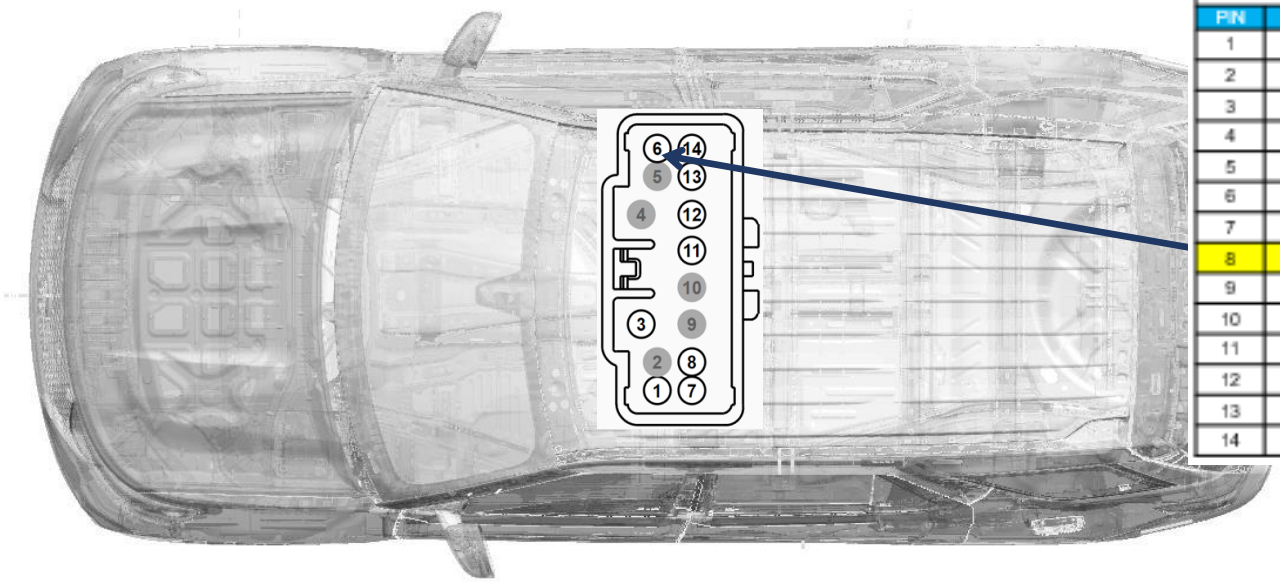



ETA Electronic Standard Relay – ESR10 ISO Micro
Description
The smart power relay ESR10 Micro (Electronic Standard Relay) is a solid state relay which can replace electro-mechanical relays.
The ESR10 is a plus switching (high side switch) closing relay (NO) in an ISO Micro automotive relay enclosure.
It allows bipolar control by a positive voltage. This space-saving relay is available in three power classes:
- 10 A for max. 85° C / (12 and 24) Vdc
- 17 A for max. 105° C / (12 and 24) Vdc
- 30 A for max. 85° C / 12 Vdc
ESR10 Micro
Applications
The ESR10 helps to switch loads whose current demand is too high to be connected directly to the controlgear. The switching function of the ESR10 is completely noiseless. This allows installation in the vehicle's interior.
The ESR10 Micro is suitable for all applications in DC 12 V or 24 V electrical systems where valves, motors, lamps etc. have to switched:
- Road vehicles (passenger cars, bicycles, trucks, buses, working vehicles and emergency cars, special vehicles)
- Construction vehicles and agricultural vehicles
- Watercraft (ships, sailing boats, motor yachts etc.)
Benefits
- The low current consumption, particularly in the ON condition, helps to reduce gas consumption as well as CO2 emissions.
- The solid state relay switches silently and features wear-free operation of all loads with an extremely long life span.
Order numbering code
Type No.
ESR10 electronic standard relay
Protection (characteristic curve)
N not protected, only short circuit protection
Type of enclosure
C2 Micro enclosure with hexagonal latching lugs
C3 Micro design without retaining clip
Terminals (pins)
A4 standard automotive, 4-pole (ISO)
Load and control
HB high-side-switch (HSS), bipolar control
Sub type
00 standard
System voltage
D1 DC 12 V
D2 DC 24 V
Current rating (at 25°C)
10 A
17 A
30 A ¹ (12 V only)
ESR10 - N C2 A4 HB - 00 - D1 - 10A ordering example
Please be informed that we have minimum ordering quantities to be observed.
Technical data (25 °C) – ESR10 Micro 10 A
Voltage supply LINE+
System voltage U_B DC 12 V / DC 24 V
Operating voltage 6...16 V / 10...32 V
Closed current¹⁾ OFF 8 µA
Load circuit LOAD
Load output MOSFET, high side switching (HSS)
Load types resistive, inductive and capacitive
Protective function short circuit proof, temperature disconnection (pulsing)
Current rating I_N 10 A
Typical life > 1,000,000 cycles
Voltage drop¹⁾ U_{ON} 75 mV
Max. short circuit current 60 A (L/R = 3 ms)
Control input IN+
Control voltage ON 12 V: ±6...16 V; 24 V: ±10...32 V
OFF 12 V: ±0...2 V; 24 V: ±0...4 V
Control current ¹⁾²⁾ 10 mA (at 13.5 V respectively 27 V) (derating see chart)
Switching frequency max. see chart
Rising edge < 5 ms
General data
Reverse polarity protection circuit, load circuit yes (reverse polarity conductive) ³⁾
Cycle times ¹⁾ t_{ON} 0.5 ms
t_{OFF} 0.5 ms
Temperature range -40 °C...85 °C
Dimensions ISO Standard Micro (with retaining lugs)
plugged in 26 x 15.5 x 26 mm
including contacts 26 x 15.5 x 37 mm
Mass¹⁾ 15 g
¹⁾ typically
²⁾ The upstream controlgear may misconstrue the situation as "wire break" due to the extremely low control current. In this case the trigger threshold should be adjusted.
³⁾ In the event of reverse polarity connection, the MOSFET will switch through automatically for self-protection.
5

For detailed schematics, please visit: https://www.motorcraftservice.com/

KEY EXTERIOR OPTIONS (Cont'd)

Brake Output



WHITE 14 WAY CONNECTOR C2808				
PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	WIG WAG L/SOM TO BCM	26	OG	ZNG02
2	–	–	–	–
3	FLASHER FRONT RIGHT (15A MAX FUSE)	16	YE-VT	CAP21
4	–	–	–	–
5	–	–	–	–
6	WIG WAG SYNC	22	GY-OG	CAP06
7	I/P ILLUMINATION	22	VT-GY	VLN04
8	BCM FUSE #30 (5A) TRAILER BRAKE INPUT	22	YE-BU	CBP30
9	–	–	–	–
10	PAITRO	22	VT-GN	SBB48B
11	BATT SAVER/SWITCH OFF INTERIOR LIGHTING	22	YE-GN	CLN09
12	CTRL MOD.– HORN SWITCH	22	VT-GY	CRH04
13	CTRL MOD.– HORN SWITCH	22	VT-GY	CRH04
14	FRONT LAMP STROBE PATTERN	22	GN-RD	CAP28

Auxiliary Equipment Power Access:

There are 2 options for obtaining power for Auxiliary Equipment Power Access:
- Rear Power Access Module
- Vehicle Integration System

The Rear Power Access point is found in the cargo area and is a battery access port for police auxiliary equipment. It can supply up to 80 amps of battery voltage. Voltage to the positive terminal of the rear power access point is supplied through two 50A fuses - connected to the battery through the power distribution box (Reference the PDB, Fuses F103 and F104).

NOTE: Battery access is provided by 2 studs contained in an enclosure, behind the passenger second row seat under the cargo area floor. The terminal with the red wire is the battery positive. Remove both fuses in the PDB before removing the cover to the rear power point. Make sure load devices can be turned off and are switched off when reinserting the fuses.

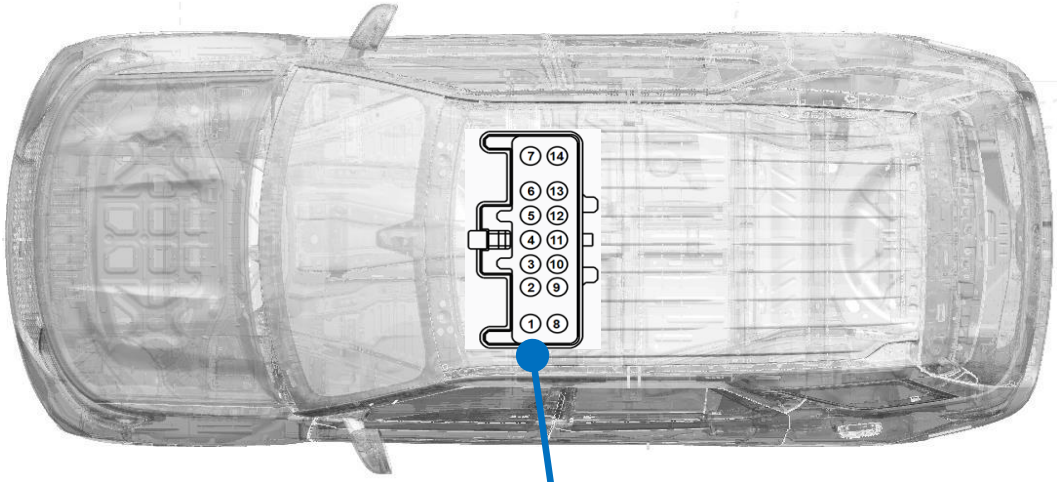
The total power capability for auxiliary equipment supported by the Police Interceptor Utility is limited 80 Amps steady state.

WARNING: The 80 Amps needs to be balanced between the Rear Power Access Module and the Vehicle Integration System Module to mitigate overload of the vehicle power system, which could lead to stalling, dead battery, or blown fuses.

For detailed schematics, please visit: https://www.motorcraftservice.com/

KEY EXTERIOR OPTIONS (Cont'd)

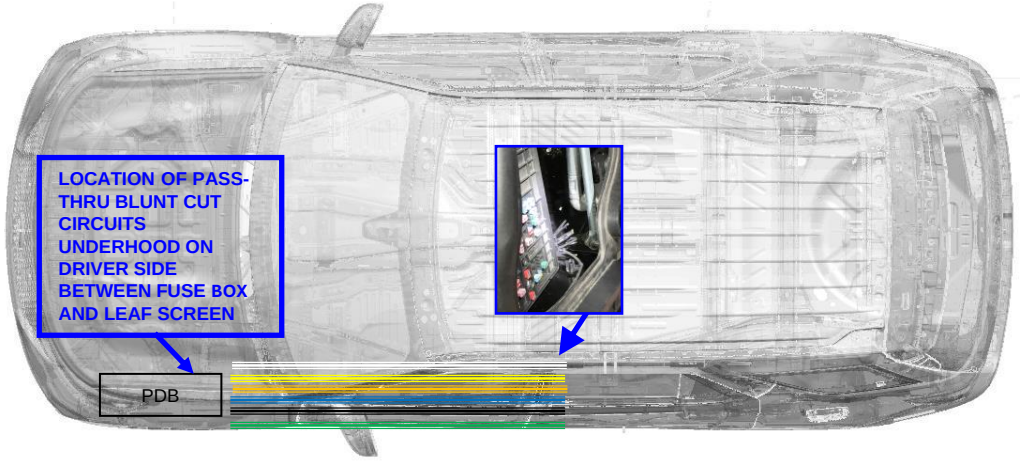
Steering Wheel Switches Output



- OUTPUT OF PINS 2, 3, 4, & 5 ARE GROUNDED WHEN STEERING WHEEL SWITCH IS PRESSED
- STEERING WHEEL SWITCHES OPERATE AS LATCHING TYPE FUNCTION
- EACH SWITCH CAPABLE OF CARRYING UP TO 1 AMP

GRAY 14 WAY CONNECTOR C2238				
PIN	DESCRIPTION	GA.	CKT COLOR	CIRCUIT
1	B+ FEED BJB FUSE #127 (20A)	16	WH-RD	SBBC7
2	CONTROL BUTTON 1	22	GY-BN	CAP14
3	CONTROL BUTTON 2	22	WH-VT	CAP15
4	CONTROL BUTTON 3	22	GN-BN	CAP16
5	CONTROL BUTTON 4	22	YE-GY	CAP17
6	POLICE START BJB FUSE #116 (5A) INPUT	22	BU-BN	CBBB6
7	RUN/START #1 BJB FUSE #54 (20A)	10	VT-OG	CBB54
8	B+ FEED #2 BJB FUSE #115 (20A)	12	BU-RD	SBBB5
9	VEHICLE SPEED	22	VT-GN	VC05
10	DELAY ACCESSORY BJB FUSE 134 (10A)	22	VT-GY	CDC40
11	B+ FEED #3 BJB FUSE #160 (10A)	22	VT-RD	SBBG0
12	PARK DETECT	22	GN + BU	CET52
13	DRIVER DOOR AJAR	22	GN-OG	CPL26
14	RUN/START #2 BJB FUSE #118 (30A)	16	GY-BU	CBBB8

Pass Thru Blunt Cut Wiring



UNDERHOOD, 12-WIRE BUNDLE LOCATED UNDER LH SIDE OF LEAF SCREEN BETWEEN JUNCTION BOX AND DASH PANEL INSIDE CAB, 12-WIRE BUNDLE LOCATED NEAR BODY CONTROL MODULE LH SIDE DRIVER FOOTWELL

12-WIRE (6 TWISTED PAIRS) BUNDLE PASS-THRU BLUNT CUT (BOTH ENDS) CIRCUITS

- WH & WH/BU
- YE & YE/BU
- OG/BK & OG
- BU/WH & BU
- BK & BK/WH
- GN/WH & GN

For detailed schematics, please visit: https://www.motorcraftservice.com/

POLICE MODIFIER GUIDE

SECTION 2 – GENERAL ELECTRICAL INFORMATION

KEY EXTERIOR OPTIONS (Cont'd)

For detailed schematics, please visit: https://www.motorcraftservice.com/

Base Vehicle — No Wiring Options

NOTE: If gold terminals are being used, mating a gold terminal to gold terminal is best, silver to gold is acceptable. DO NOT use a tin terminal to a gold terminal.

- **WIG-WAG CONTROLLED BY BODY CONTROL MODULE (BCM) STANDARD ON ALL INTERCEPTORS**
- **FACTORY DEFAULT WIG-WAG FLASH PATTERN IS TRADITIONAL PING-PONG**
- **2 ADDITIONAL FLASH PATTERNS AVAILABLE WITH FDRS TOOL**

GROUNDING PIN 1 ON 14-WAY WHITE CONNECTOR (LOCATED UNDER CENTER CONSOLE MOUNTING PLATE) WILL ACTIVATE HEADLAMP WIG-WAGS

DO NOT APPLY 12V TO PIN 1 FOR WIG-WAG CONTROL

WIG-WIG CONTROL
- **CONTROL INCLUDED WITH CENCOM READY-FOR-ROAD OPTION**
- **WITHOUT READY-FOR-ROAD OPTION SWITCH TO BE ADDED DURING UPFIT**

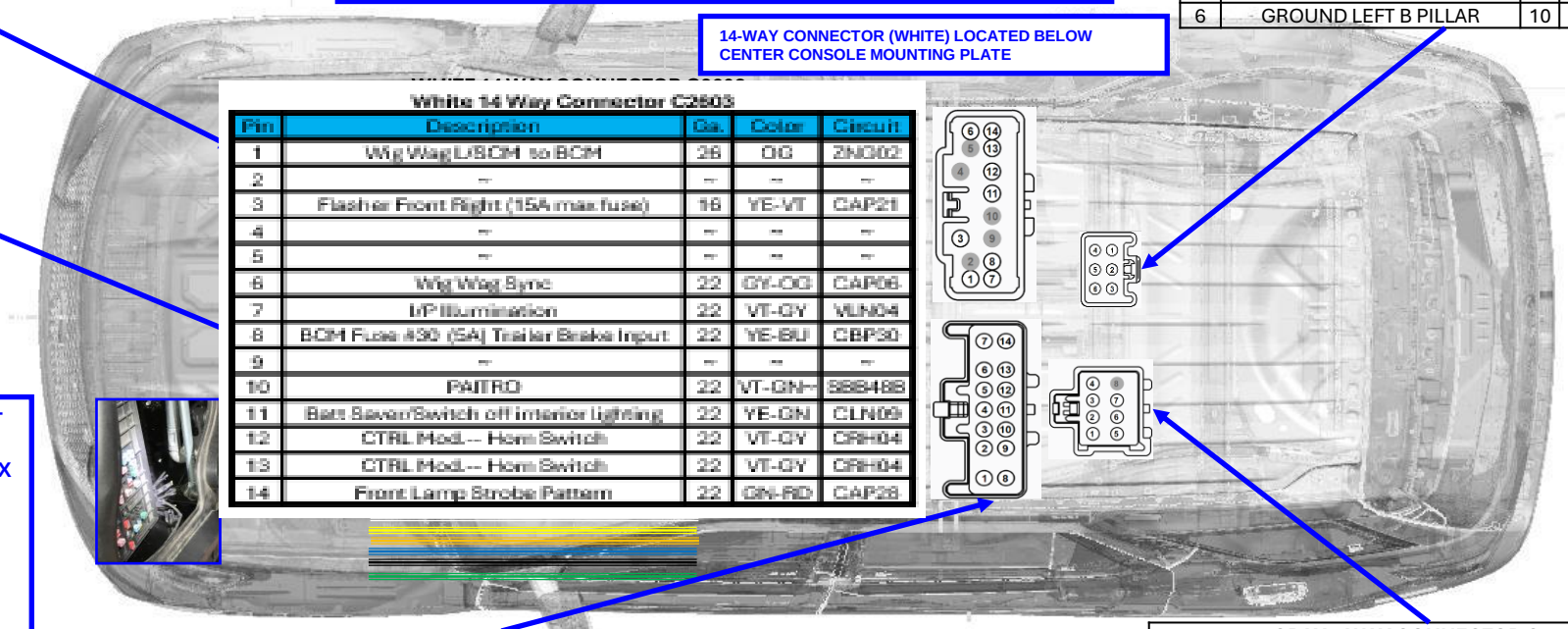
14-WAY CONNECTOR (WHITE) LOCATED BELOW CENTER CONSOLE MOUNTING PLATE

- OUTPUT OF PIN 8 IS 12V OUTPUT WHEN BRAKE APPLIED
- THIS OUTPUT CANNOT BE USED TO DRIVE RELAY

LOCATION OF PASS-THRU BLUNT CUT CIRCUITS UNDERHOOD ON DRIVER SIDE BETWEEN FUSE BOX AND LEAF SCREEN

12-WIRE (6 TWISTED PAIRS) BUNDLE PASS-THRU BLUNT CUT (BOTH ENDS) CIRCUITS
- YE & YE/BU
- WH & WH/BU
- GN/WH & GN
- BU/WH & BU
- BK & BK/WH
- OG/BK & OG

- OUTPUT OF PIN 13 GOES TO GROUND WHEN DRIVER DOOR AJAR
- THIS OUTPUT CAN BE USED TO GROUND A LOW CURRENT RELAY COIL (I.E., 180 MA MAXIMUM)



White 14 Way Connector C2503

Pin	Description	Ga.	Color	Circuit
1	Wig Wag L/BCM to BCM	26	OG	2NG02
2	--	--	--	--
3	Flasher Front Right (15A max fuse)	16	YE-VT	CAP21
4	--	--	--	--
5	--	--	--	--
6	Wig Wag Sync	22	GY-OG	CAP06
7	I/P Illumination	22	VT-GY	VLN04
8	BCM Fuse #30 (5A) Trailer Brake Input	22	YE-BU	CBP30
9	--	--	--	--
10	PATRO	22	VT-GN	SBB48B
11	Batt Saver/Switch off interior lighting	22	YE-GN	CLN09
12	CTRL Mod.-- Horn Switch	22	VT-GY	CRH04
13	CTRL Mod.-- Horn Switch	22	VT-GY	CRH04
14	Front Lamp Strobe Pattern	22	GN-RD	CAP28

GRAY 6 WAY CONNECTOR C3399

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	BATT FEED FUSE BJB #107 (40A)	10	BU-WH	SBBA7
2	BATT FEED FUSE BJB #106 (40A)	10	YE	SBBA6
3	BATT FEED FUSE BJB#150 (40A)	10	BN-RD	SBBF0
4	GROUND LEFT B PILLAR	10	BK-VT	GD343
5	GROUND LEFT B PILLAR	10	BK-VT	GD343
6	GROUND LEFT B PILLAR	10	BK-VT	GD343

GRAY 14 WAY CONNECTOR C2238

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	B+ FEED BJB FUSE #127 (20A)	16	WH-RD	SBBC7
2	CONTROL BUTTON 1	22	GY-BN	CAP14
3	CONTROL BUTTON 2	22	WH-VT	CAP15
4	CONTROL BUTTON 3	22	GN-BN	CAP16
5	CONTROL BUTTON 4	22	YE-GY	CAP17
6	POLICE START BJB FUSE #116 (5A) INPUT	22	BU-BN	CBBB6
7	RUN/START #1 BJB FUSE #54 (20A)	10	VT-OG	CBB54
8	B+ FEED #2 BJB FUSE #115 (20A)	12	BU-RD	SBBB5
9	VEHICLE SPEED	22	VT-GN	VC05
10	DELAY ACCESSORY BJB FUSE 134 (10A)	22	VT-GY	CDC40
11	B+ FEED #3 BJB FUSE #160 (10A)	22	VT-RD	SBBG0
12	PARK DETECT	22	GN + BU	CET52
13	DRIVER DOOR AJAR	22	GN-OG	CPL26
14	RUN/START #2 BJB FUSE #118 (30A)	16	GY-BU	CBBB8

GRAY 8 WAY CONNECTOR C3853
PINS 1-7 ARE INTERCONNECTED

PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	VPWR FROM CENTCOM RELAY	.50	BN	VAP08
2	VPWR FROM CENTCOM RELAY	.50	GN-BU	RAP08
3	VPWR FROM CENTCOM RELAY	.50	BN-YE	CAP22
4	VPWR FROM CENTCOM RELAY	.50	BN-BU	CAP22
5	VPWR FROM CENTCOM RELAY	.50	BN-RD	CAP22
6	VPWR FROM CENTCOM RELAY	.50	BN-WH	CAP22
7	B+FLASHER (LIGHTING/SIREN MODULE)	.35	YE-BU	CAP51A
8	~	~	~	~

UNDERHOOD, 12-WIRE BUNDLE LOCATED UNDER LH SIDE OF LEAF SCREEN BETWEEN JUNCTION BOX AND DASH PANEL INSIDE CAB, 12-WIRE BUNDLE LOCATED NEAR BODY CONTROL MODULE LH SIDE DRIVER FOOTWELL

KEY EXTERIOR OPTIONS (Cont'd)

Wig-Wag Headlamps Control

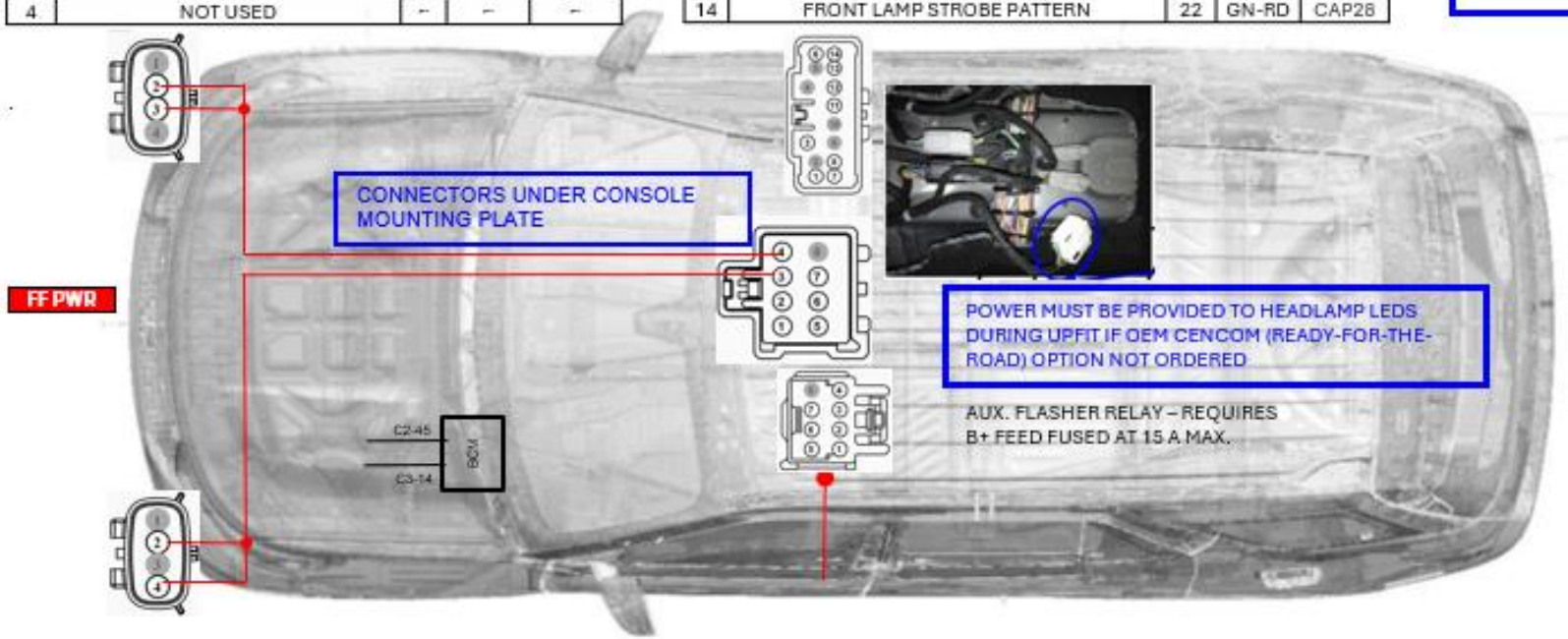
WHITE 14 WAY CONNECTOR C2603				
Pin	DESCRIPTION	GA.	COLOR	CIRCUIT
1	WIG WAG L/SCM TO BCM	26	OG	ZNG02
2	-	-	-	-
3	FLASHER FRONT RIGHT (15A MAX FUSE)	16	YE-VT	CAP21
4	-	-	-	-
5	-	-	-	-
6	WIG WAG SYNC	22	GY-OG	CAP06
7	I/P ILLUMINATION	22	VT-GY	VLN04
8	BCM FUSE #30 (5A) TRAILER BRAKE INPUT	22	YE-BU	CBP30
9	-	-	-	-
10	PAITRO	22	VT-GN	SBB48B
11	BATT SAVER/SWITCH OFF INTERIOR LIGHTING	22	YE-GN	CLN09
12	CTRL MOD.-- HORN SWITCH	22	VT-GY	CRH04
13	CTRL MOD.-- HORN SWITCH	22	VT-GY	CRH04
14	FRONT LAMP STROBE PATTERN	22	GN-RD	CAP28

GROUNDING PIN 1 ON 14-WAY WHITE CONNECTOR (LOCATED UNDER CENTER CONSOLE MOUNTING PLATE) WILL ACTIVATE HEADLAMP WIG-WAGS.

DO NOT APPLY 12V+ TO PIN 1 FOR WIG-WAG CONTROL

WIG-WAG CONTROL
- CONTROL INCLUDED WITH CENCOM READY-FOR-ROAD OPTION
- WITHOUT READY-FOR-ROAD OPTION SWITCH TO BE ADDED DURING UPFIT

14A303 INLINE RH (C1045)				
PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	NOT USED	-	-	-
2	POLICE - FLASHER FRONT POWER	20	BN-YE	CAP22
3	POLICE - FLASHER FRONT POWER	20	BN-GN	CAP22
4	NOT USED	-	-	-



POWER MUST BE PROVIDED TO HEADLAMP LEDS DURING UPFIT IF OEM CENCOM (READY-FOR-THE-ROAD) OPTION NOT ORDERED

AUX. FLASHER RELAY – REQUIRES B+ FEED FUSED AT 15 A MAX.

14A303 INLINE LH (C1133)				
PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	NOT USED	-	-	-
2	POLICE - FLASHER FRONT POWER	20	BN-YE	CAP22
3	NOT USED	-	-	-
4	POLICE - FLASHER FRONT POWER	20	BN-GN	CAP22

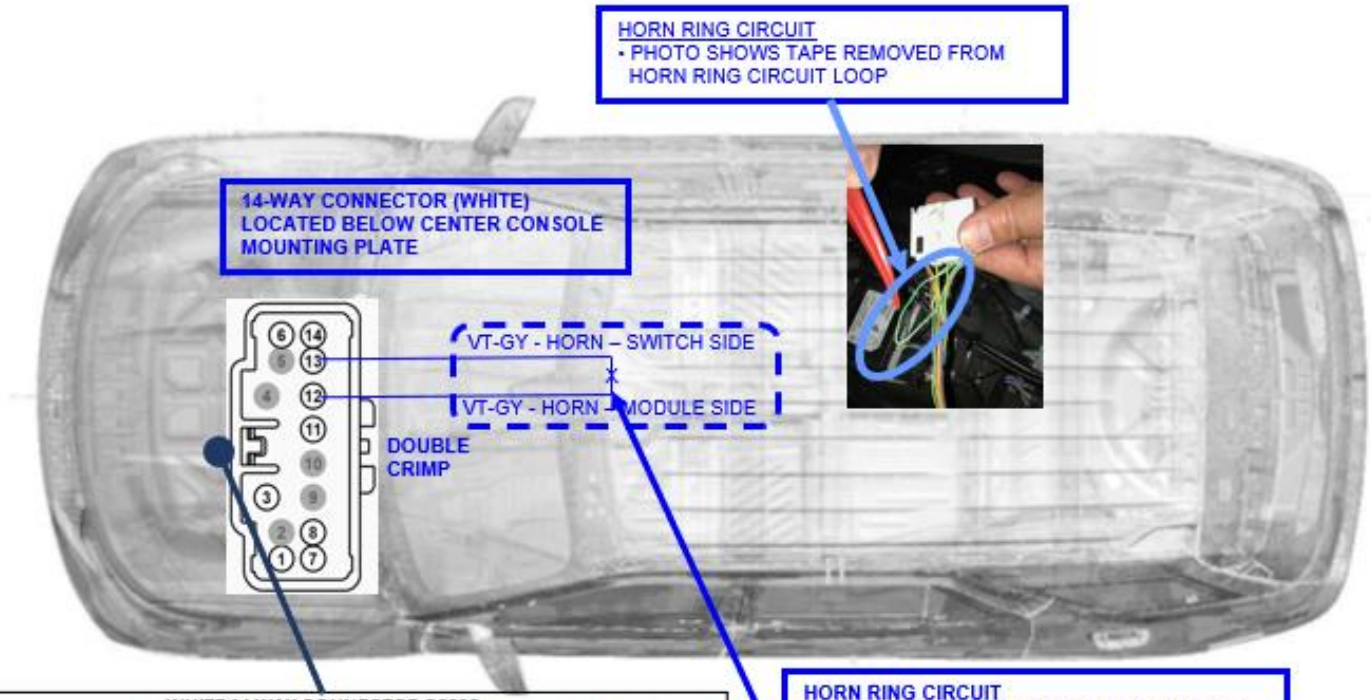
For detailed schematics, please visit: https://www.motorcraftservice.com/

KEY EXTERIOR OPTIONS (Cont'd)

Horn Ring Circuit

NOTE: Harnesses CANNOT be taped to any fluid line. A sufficient clearance of 19 mm or greater should be maintained between harness and lines.

For detailed schematics, please visit: https://www.motorcraftservice.com/


HORN RING CIRCUIT
• PHOTO SHOWS TAPE REMOVED FROM HORN RING CIRCUIT LOOP
14-WAY CONNECTOR (WHITE) LOCATED BELOW CENTER CONSOLE MOUNTING PLATE
VT-GY - HORN – SWITCH SIDE
VT-GY - HORN – MODULE SIDE
DOUBLE CRIMP
HORN RING CIRCUIT
• GROUND SIDE LOOP ACCESS TO CIRCUIT
• LOOP IS SHIPPED TAPED TO HARNESS
• SPLICE LOOP FOR ACCESS PER FORD GUIDELINES (SECTION 5 ELECTRICAL OF MODIFIER GUIDE) AND SEAL/PROTECT SPLICE

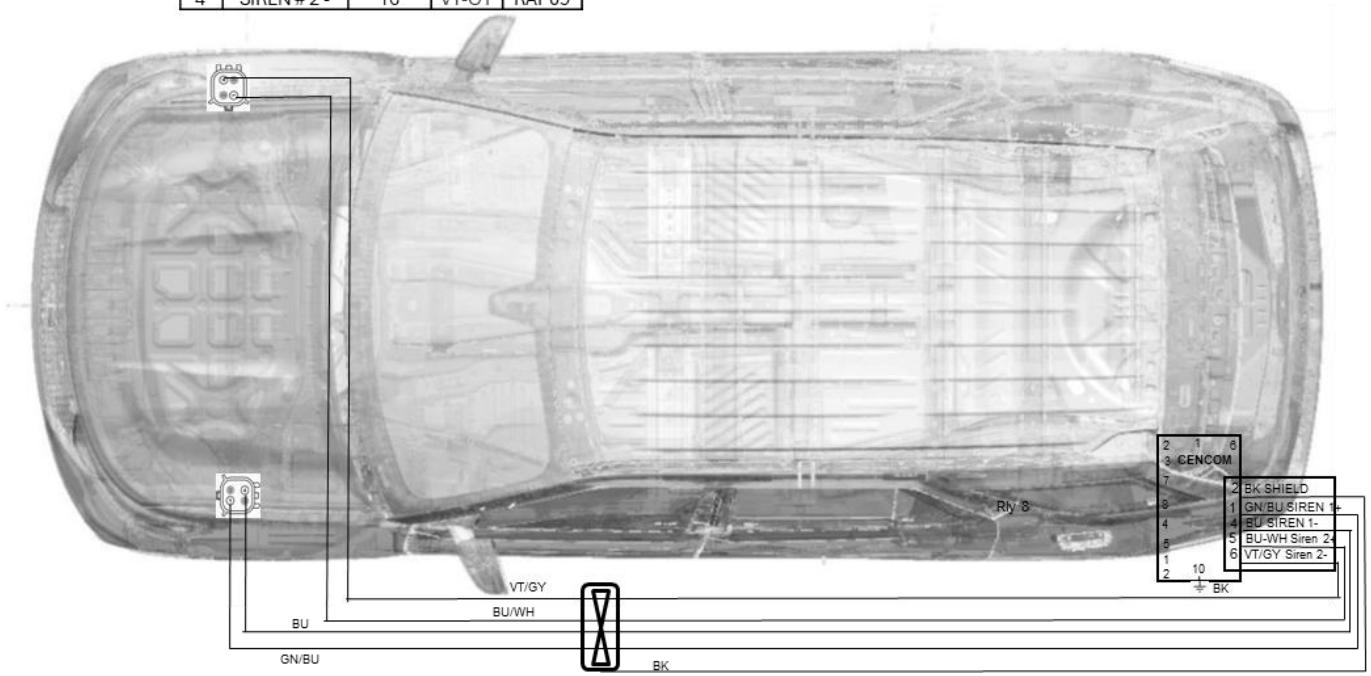
WHITE 14 WAY CONNECTOR C2803				
PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	WIG WAG L/SCM TO BCM	26	OG	ZNG02
2	–	–	–	–
3	FLASHER FRONT RIGHT (15A MAX FUSE)	16	YE-VT	CAP21
4	–	–	–	–
5	–	–	–	–
6	WIG WAG SYNC	22	GY-OG	CAP06
7	I/P ILLUMINATION	22	VT-GY	VLN04
8	BCM FUSE #30 (5A)TRAILER BRAKE INPUT	22	YE-BU	CBP30
9	–	–	–	–
10	PAITRO	22	VT-GN	SBB48B
11	BATT SAVER/SWITCH OFF INTERIOR LIGHTING	22	YE-GN	CLN09
12	CTRL MOD.-- HORN SWITCH	22	VT-GY	CRH04
13	CTRL MOD.-- HORN SWITCH	22	VT-GY	CRH04
14	FRONT LAMP STROBE PATTERN	22	GN-RD	CAP28

For detailed schematics, please visit: https://www.motorcraftservice.com/

KEY EXTERIOR OPTIONS (Cont'd)

Location Of Siren Connector #1 and Siren Connector #2

SIREN SPEAKER #2 (C1474)				
PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	SIREN # 2 +	16	BU-WH	VAP09
4	SIREN # 2 -	16	VT-GY	RAP09



SIREN SPEAKER #1 (C1473)				
PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	SIREN # 1 +	16	GN-BU	VAP07
4	SIREN # 1 -	16	BU	RAP07

For detailed schematics, please visit: https://www.motorcraftservice.com/

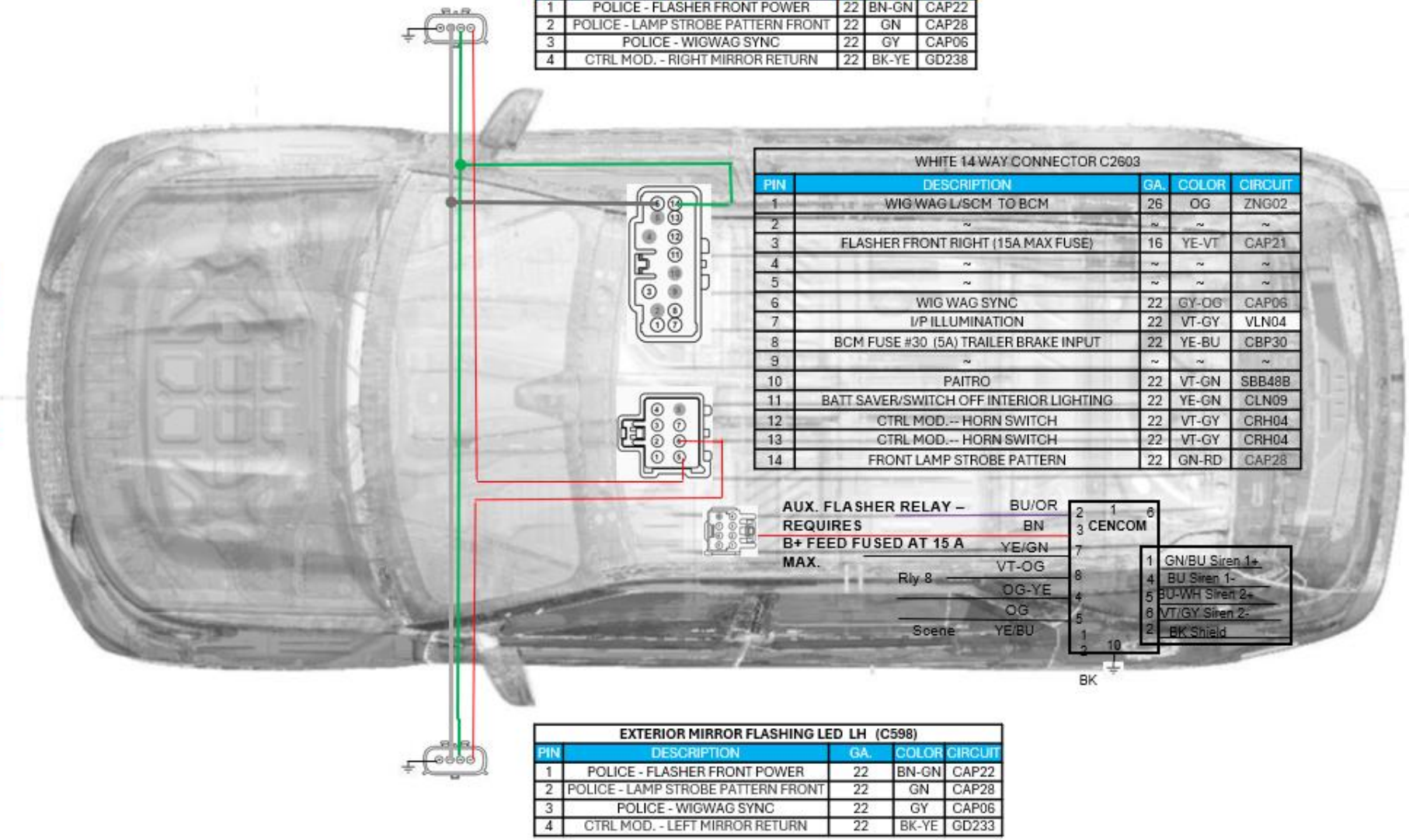
KEY EXTERIOR OPTIONS (Cont'd)

Exterior Mirror Flashing LED

EXTERIOR MIRROR FLASHING LED RH (C698)				
PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	POLICE - FLASHER FRONT POWER	22	BN-GN	CAP22
2	POLICE - LAMP STROBE PATTERN FRONT	22	GN	CAP28
3	POLICE - WIGWAG SYNC	22	GY	CAP06
4	CTRL MOD. - RIGHT MIRROR RETURN	22	BK-YE	GD238

FF PWR
PATTERN
SYNC
DATA
GND or CIRCUIT

WHITE 14 WAY CONNECTOR C2603				
PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	WIG WAG L/SCM TO BCM	26	OG	ZNG02
2	~	~	~	~
3	FLASHER FRONT RIGHT (15A MAX FUSE)	16	YE-VT	CAP21
4	~	~	~	~
5	~	~	~	~
6	WIG WAG SYNC	22	GY-OG	CAP06
7	I/P ILLUMINATION	22	VT-GY	VLN04
8	BCM FUSE #30 (5A) TRAILER BRAKE INPUT	22	YE-BU	CBP30
9	~	~	~	~
10	PAITRO	22	VT-GN	SBB48B
11	BATT SAVER/SWITCH OFF INTERIOR LIGHTING	22	YE-GN	CLN09
12	CTRL MOD.-- HORN SWITCH	22	VT-GY	CRH04
13	CTRL MOD.-- HORN SWITCH	22	VT-GY	CRH04
14	FRONT LAMP STROBE PATTERN	22	GN-RD	CAP28



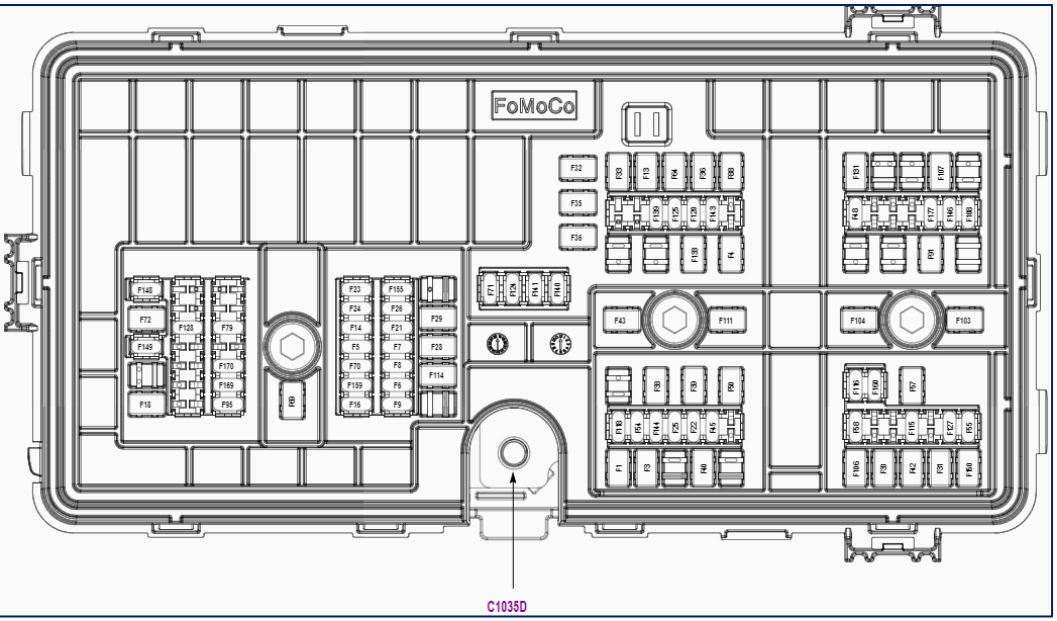
EXTERIOR MIRROR FLASHING LED LH (C598)				
PIN	DESCRIPTION	GA.	COLOR	CIRCUIT
1	POLICE - FLASHER FRONT POWER	22	BN-GN	CAP22
2	POLICE - LAMP STROBE PATTERN FRONT	22	GN	CAP28
3	POLICE - WIGWAG SYNC	22	GY	CAP06
4	CTRL MOD. - LEFT MIRROR RETURN	22	BK-YE	GD233

For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM

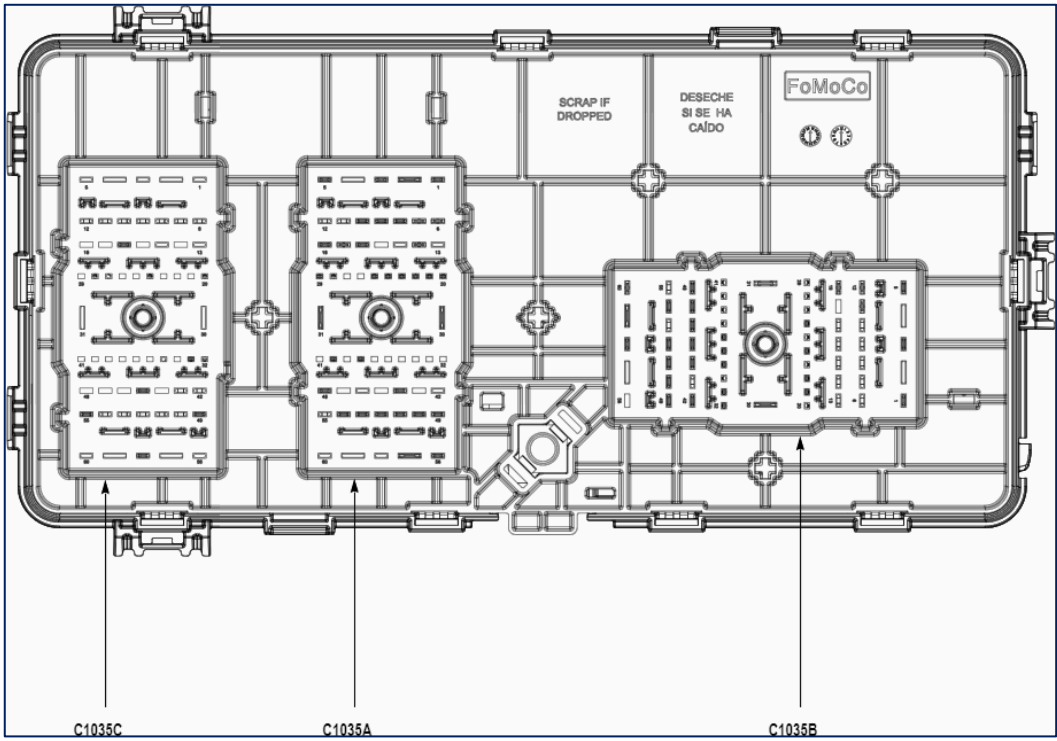
Battery Junction Box (BJB)

For further schematic information consult https://www.motorcraftservice.com/Home/SetCountry?returnUrl=%2F



TOP VIEW

BOTTOM VIEW

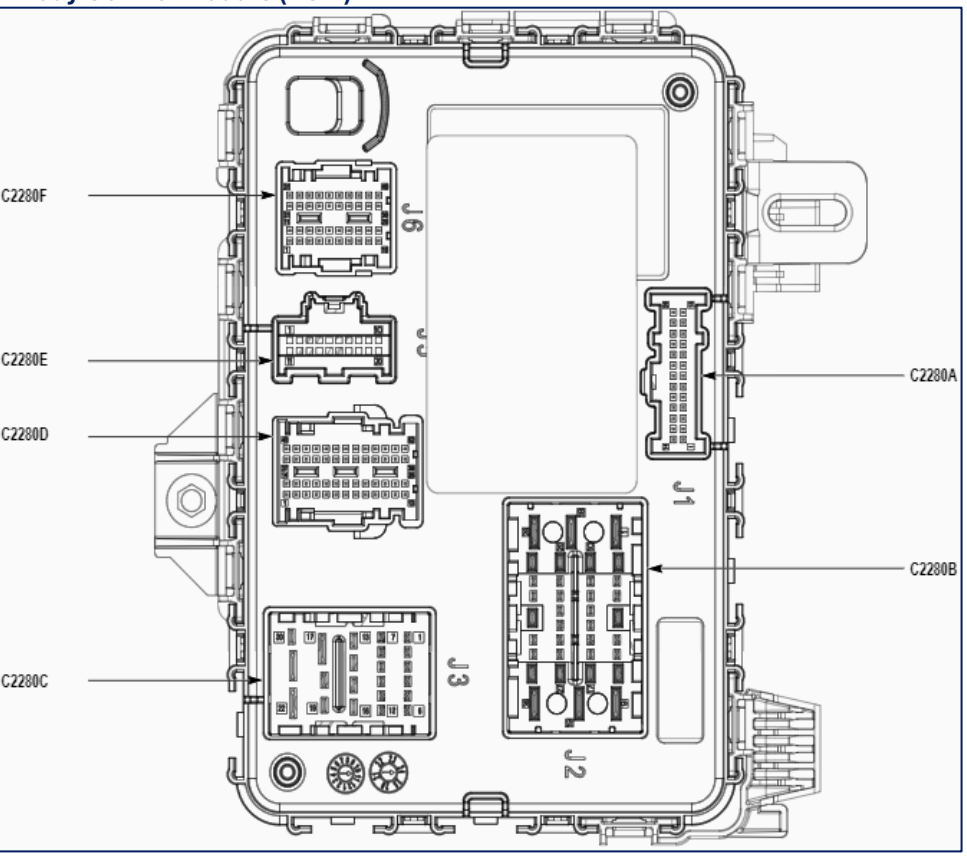


For detailed schematics, please visit: https://www.motorcraftservice.com/

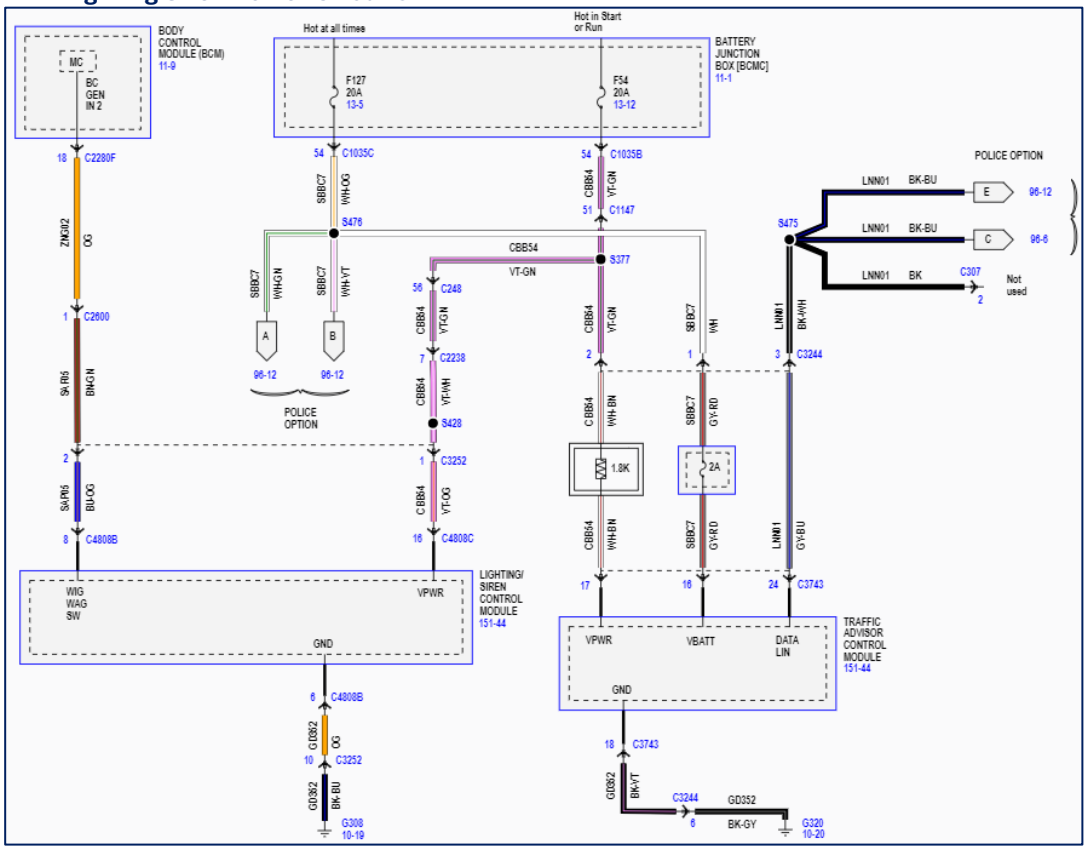
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

Body Control Module (BCM)



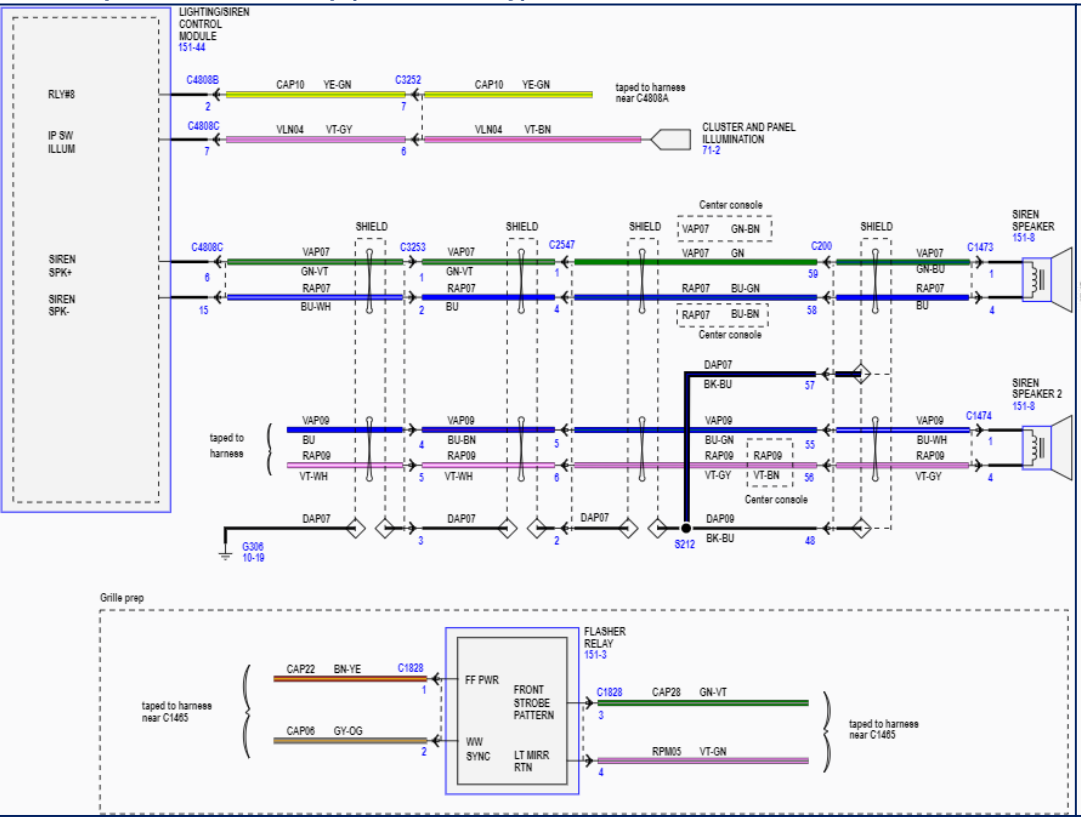
Lighting Siren Power Circuits



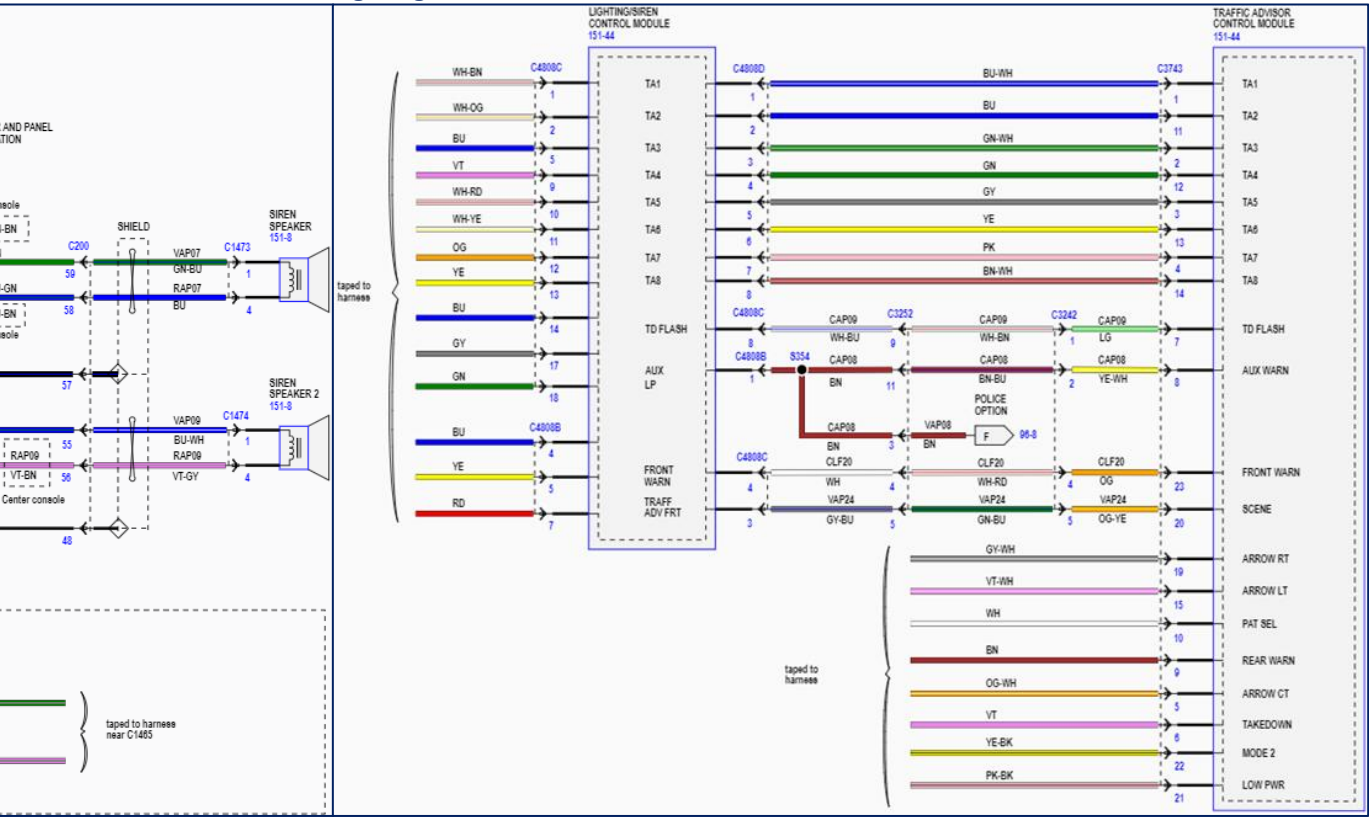
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

Siren Speaker & Grille Prep (Flasher Relay)



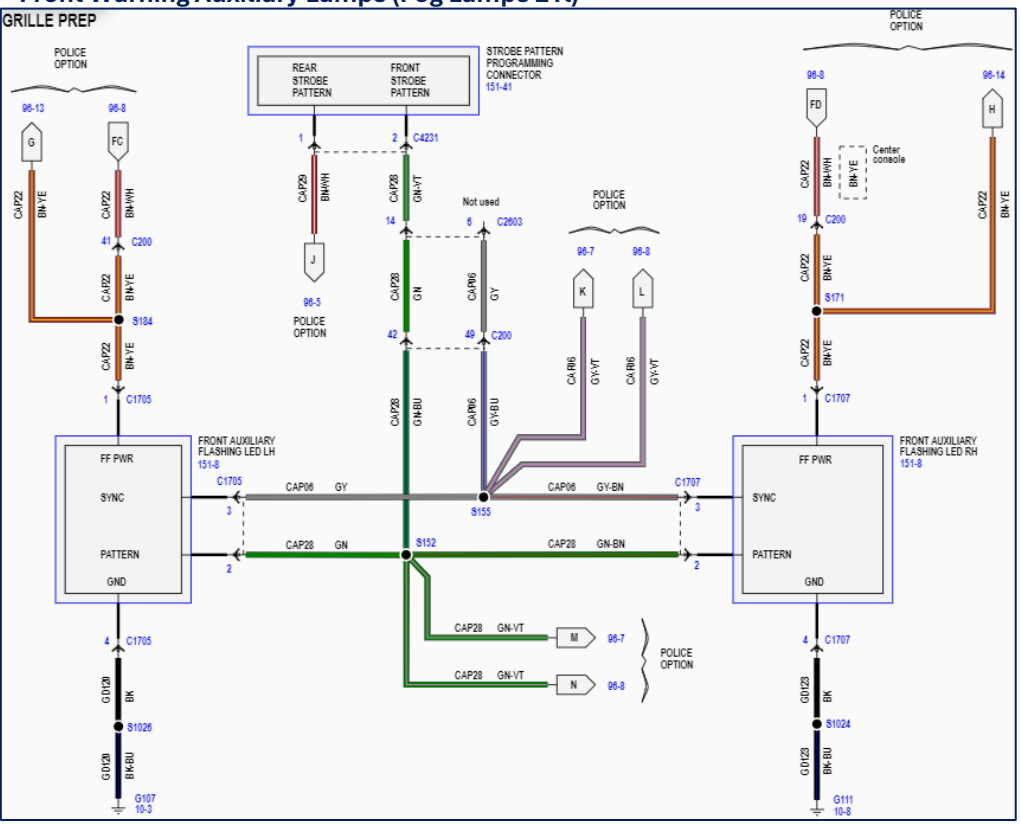
Lighting/Siren Control Module / Traffic Advisor Control Module



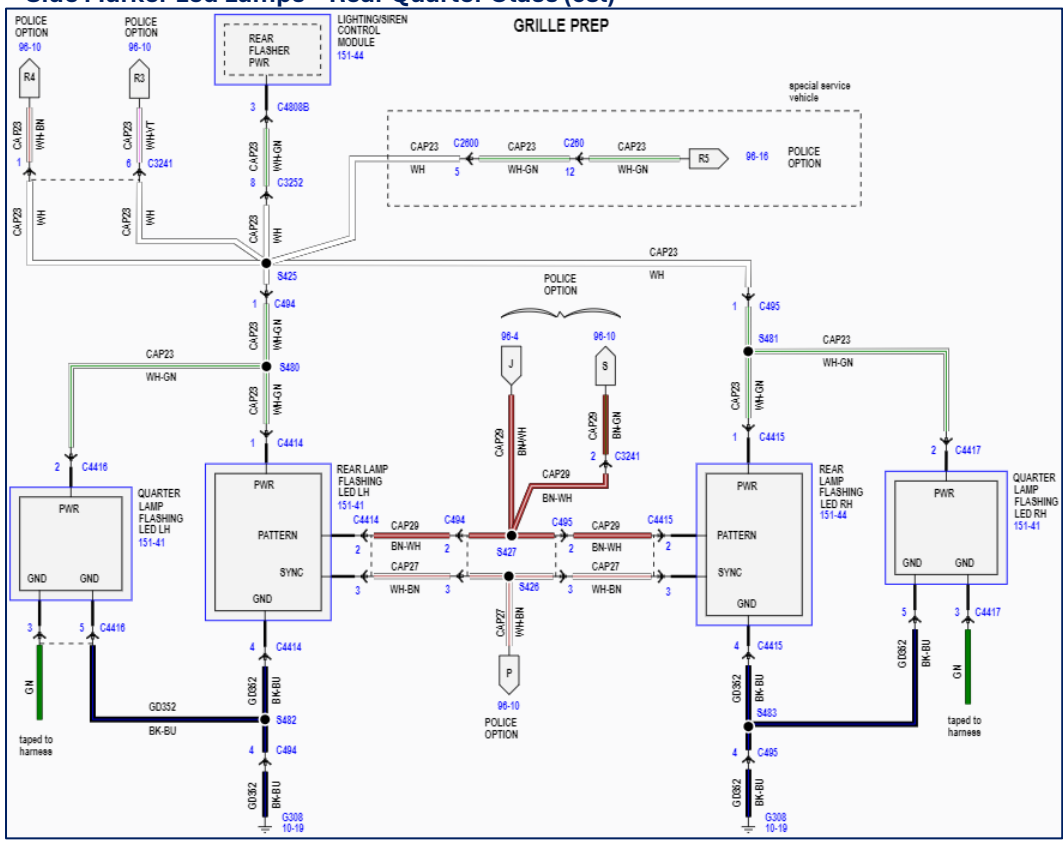
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

Front Warning Auxiliary Lamps (Fog Lamps 21l)



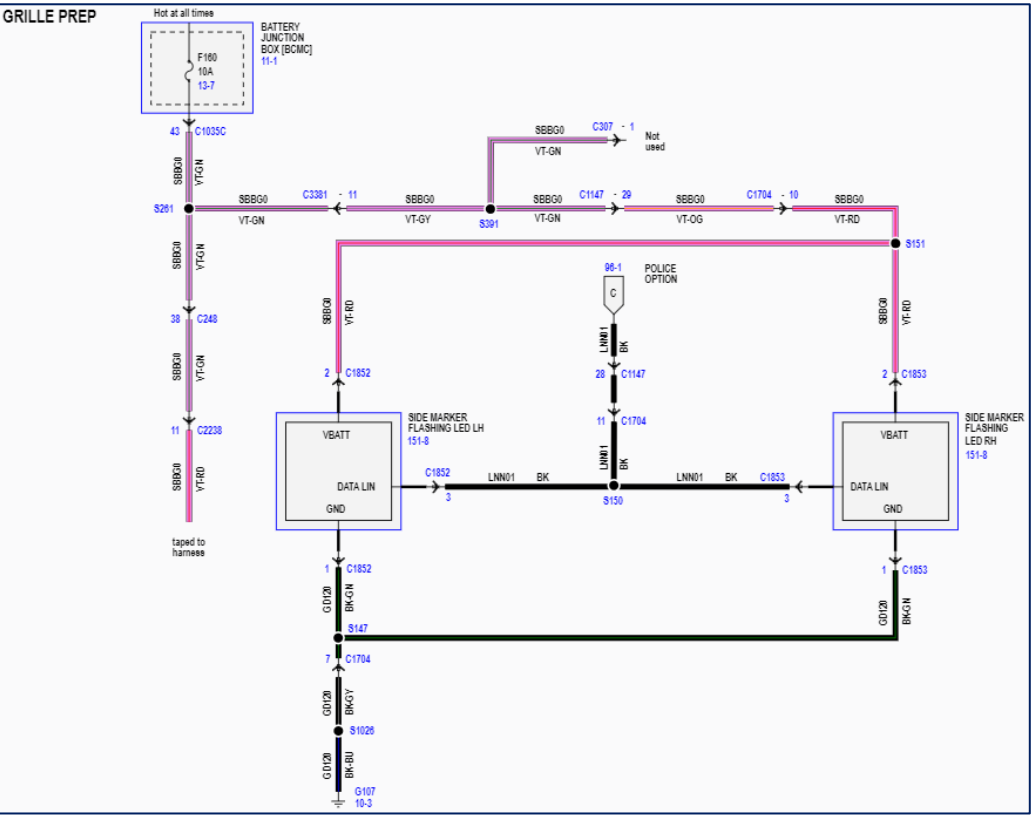
Side Marker Led Lamps – Rear Quarter Glass (63l)



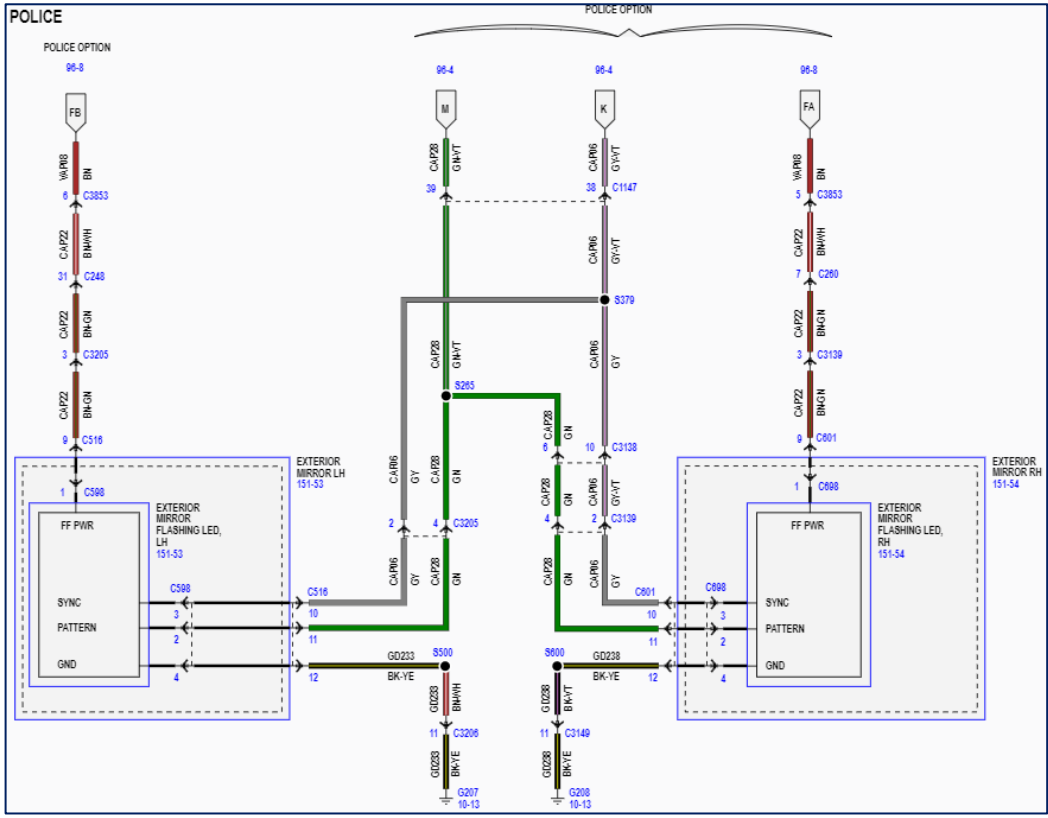
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

Front Headlamp Lighting Solution (66a) (Side Marker)



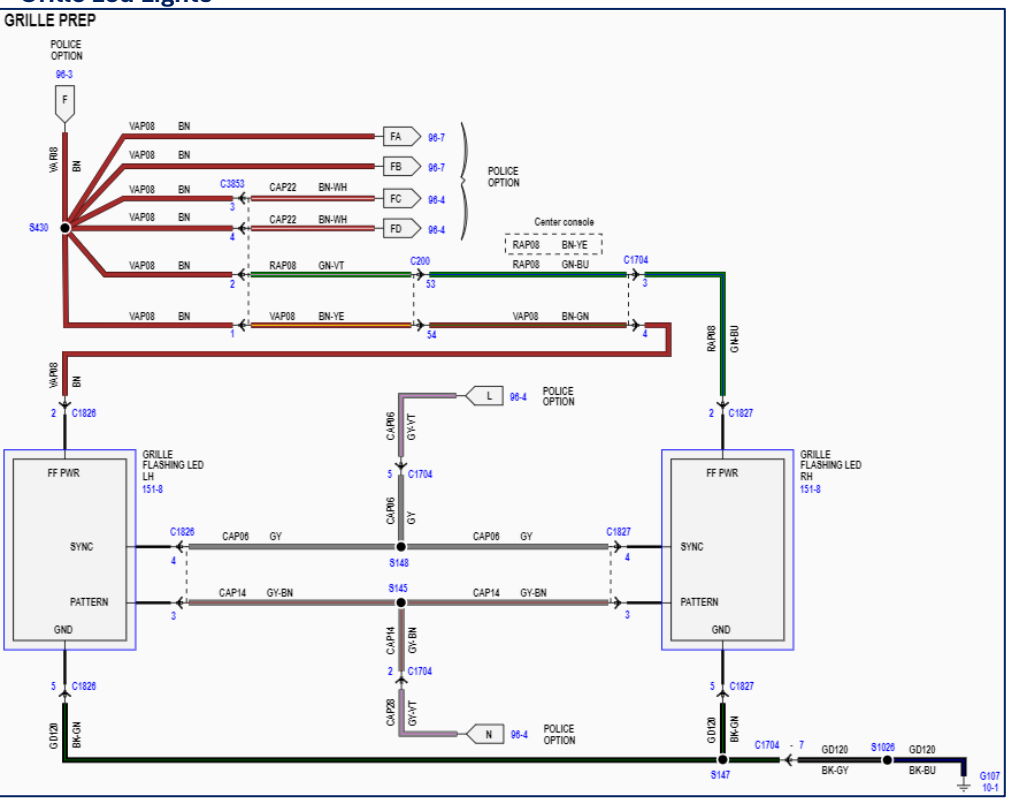
Mirror Lights



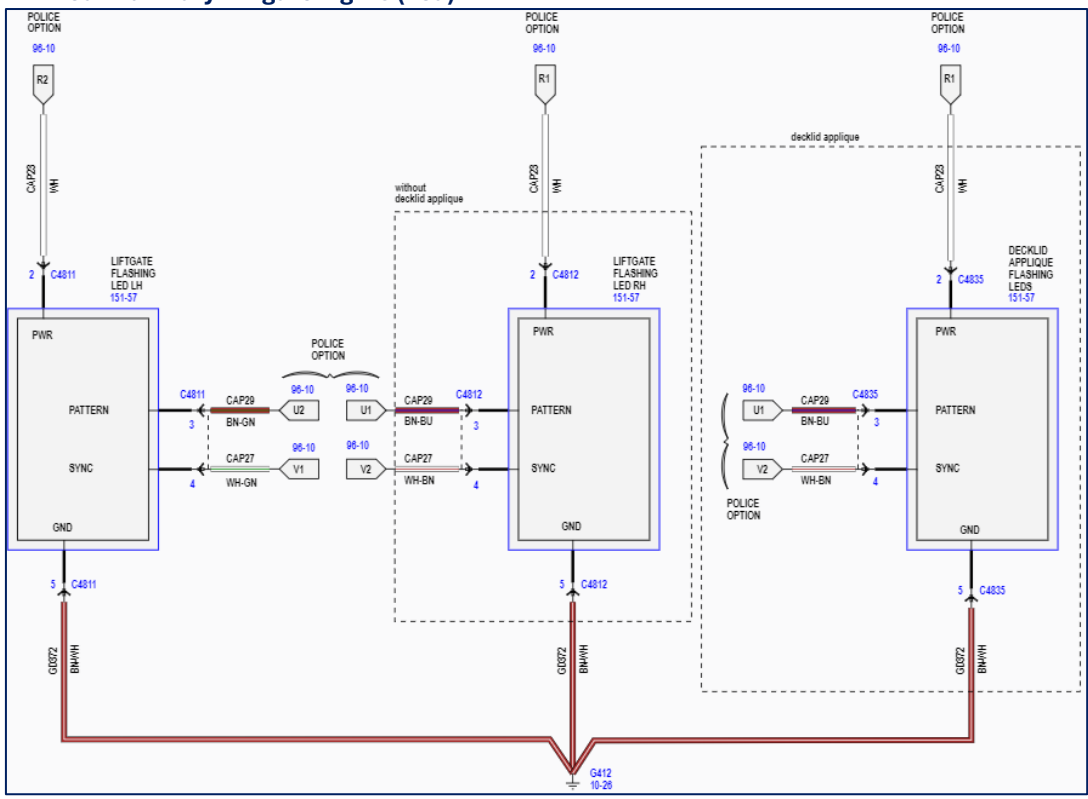
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

Grille Led Lights



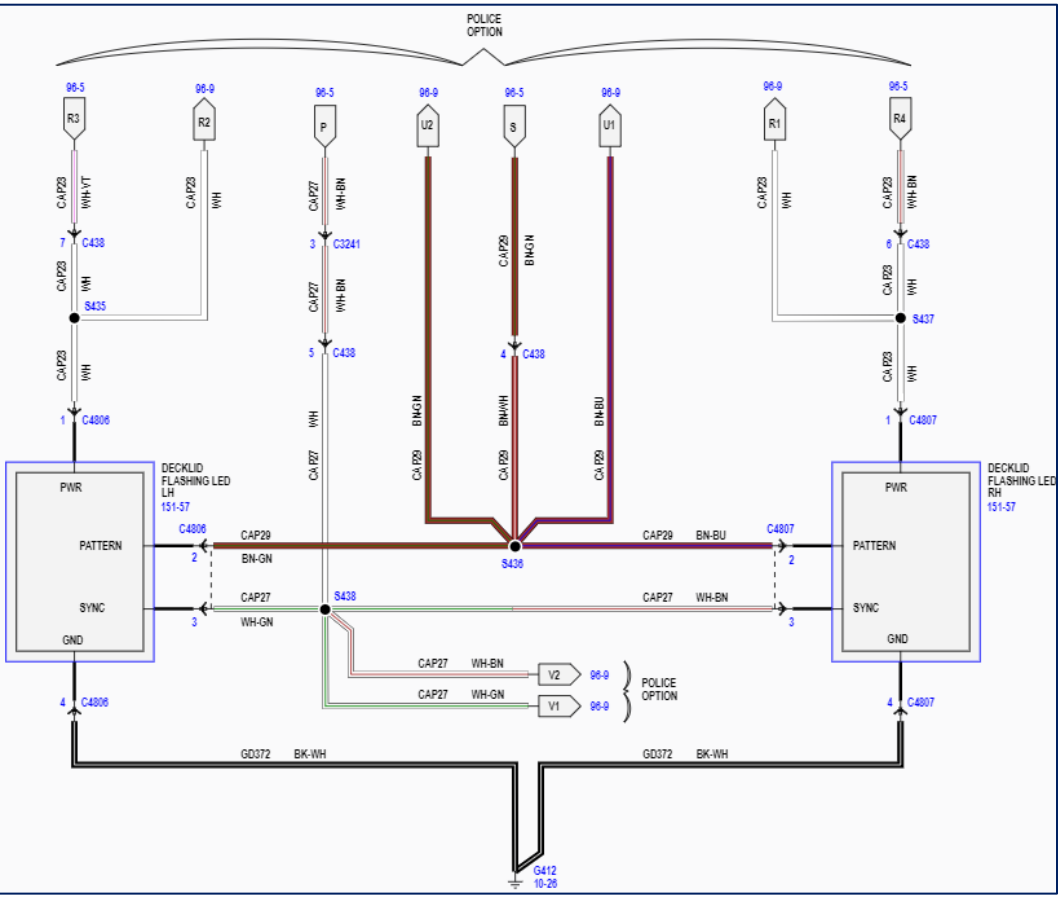
Rear Auxiliary Liftgate Lights (43a)



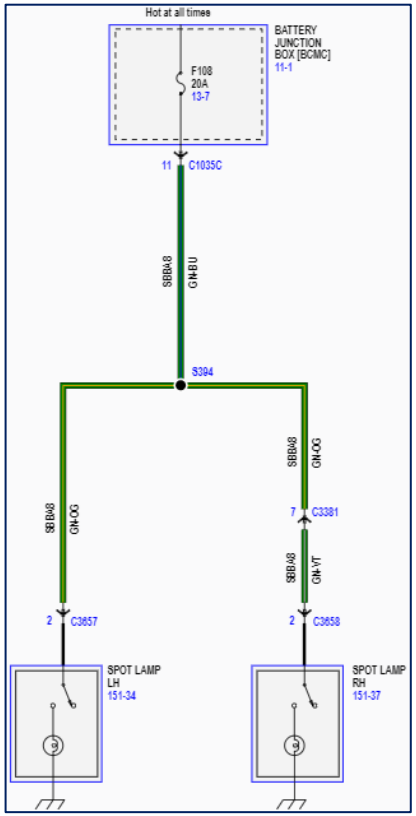
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

Police Liftgate Lights (Top And Liftgate Lip) Rear Lighting Solution (66c)



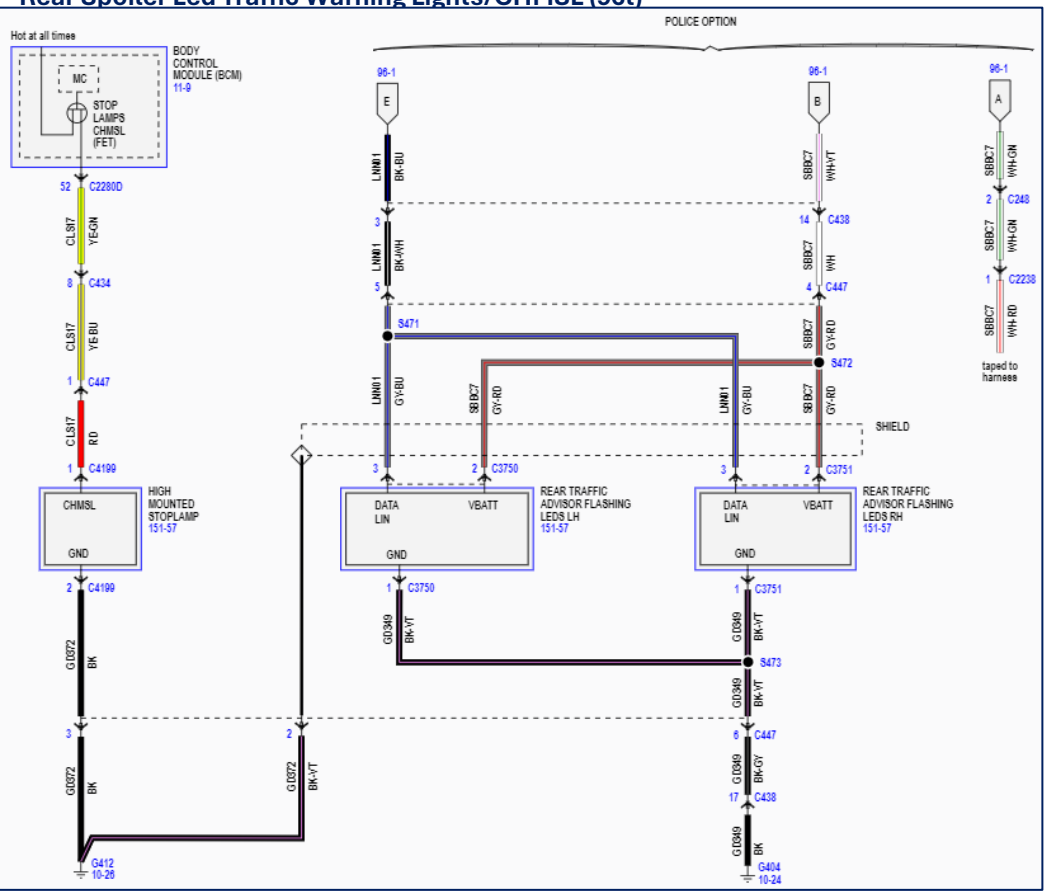
LED Spot Lamps



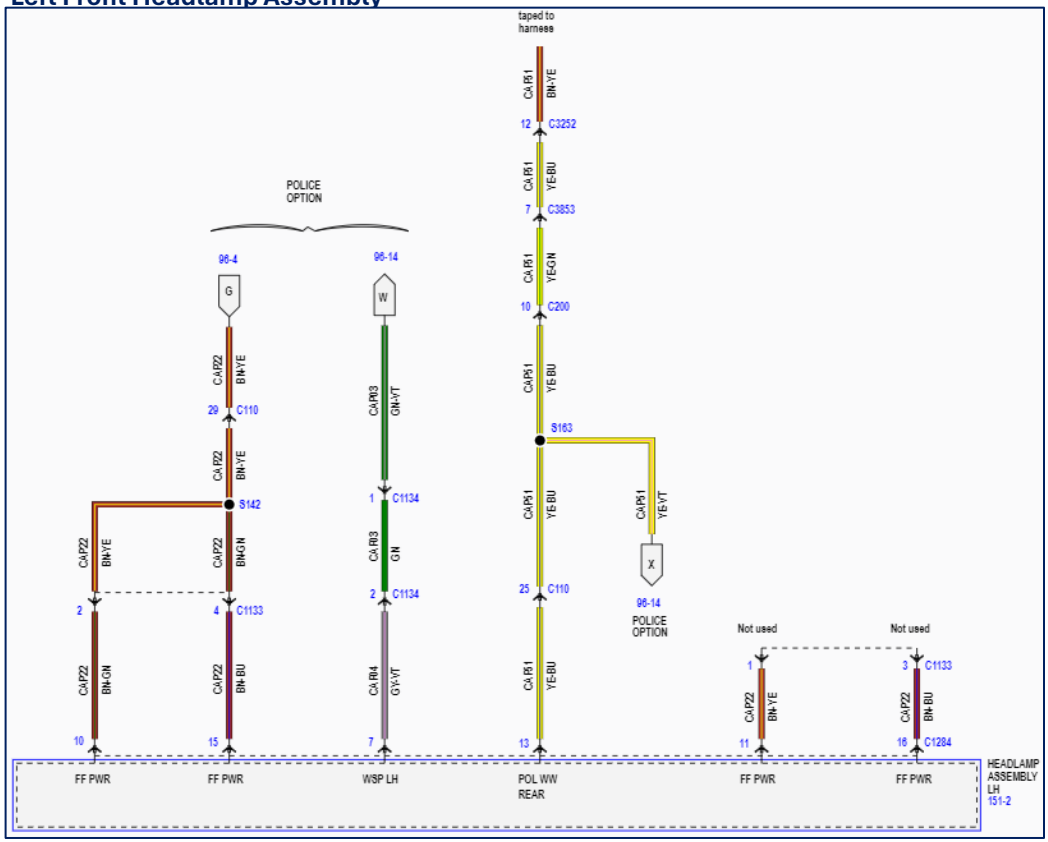
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

Rear Spoiler Led Traffic Warning Lights/CHMSL (96t)



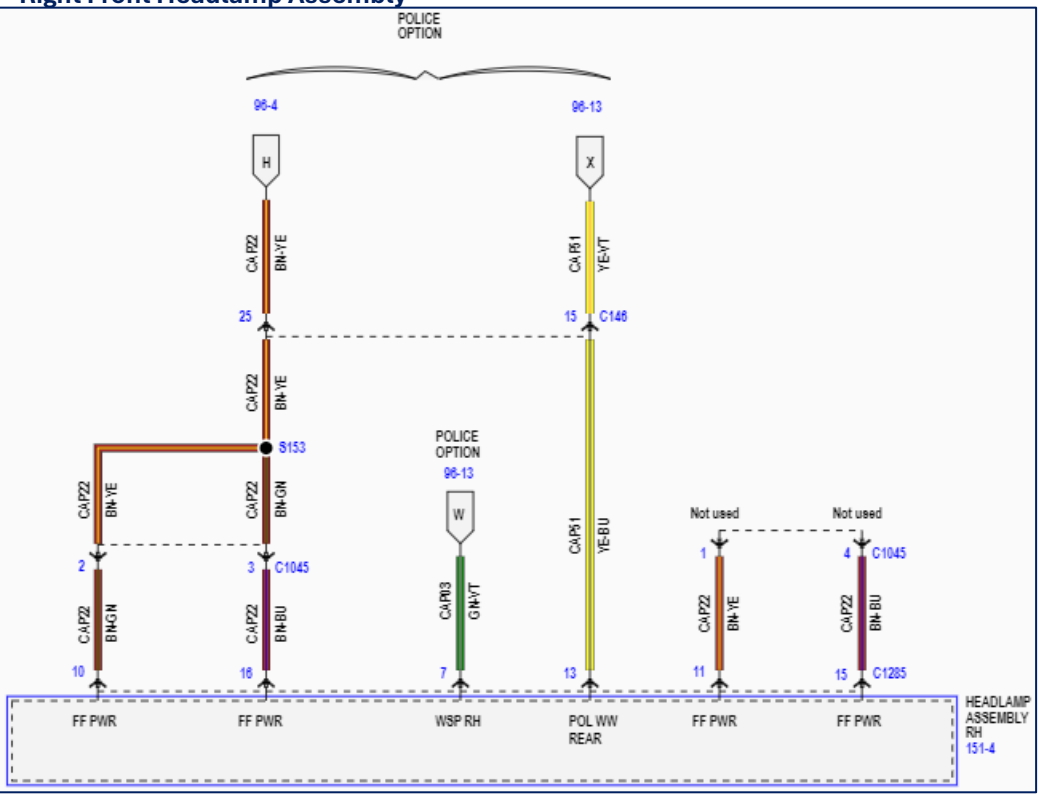
Left Front Headlamp Assembly



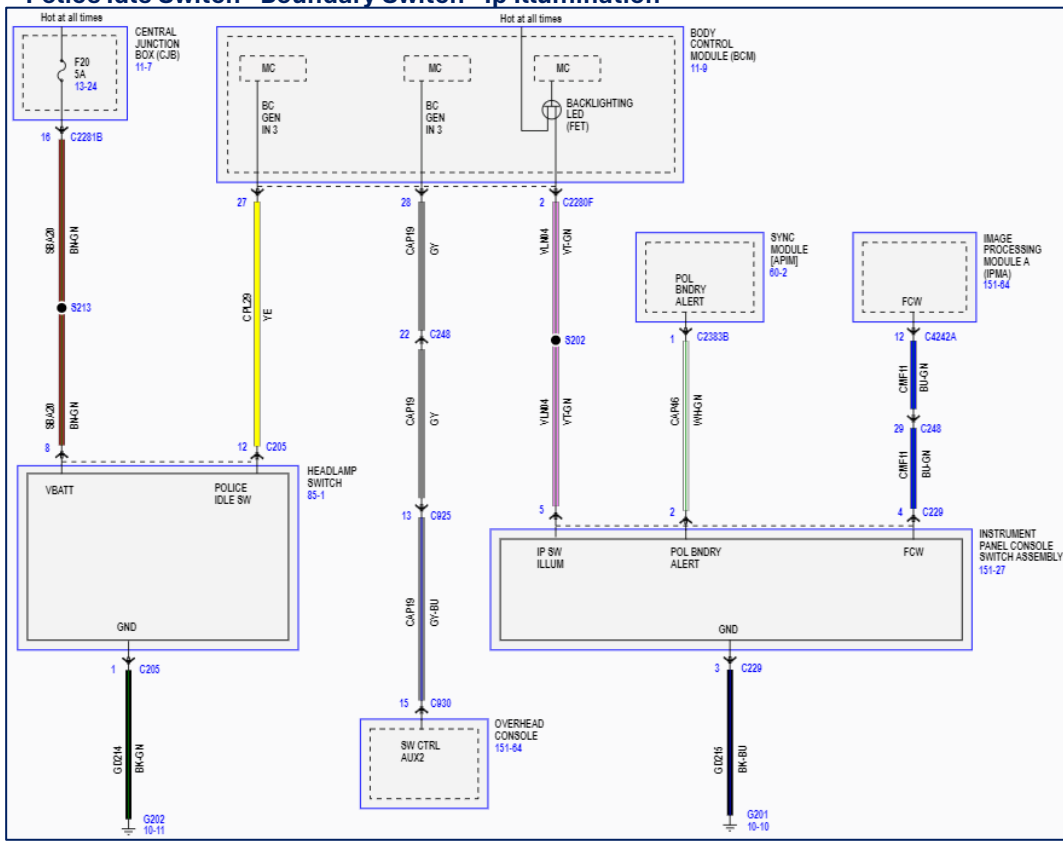
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

Right Front Headlamp Assembly



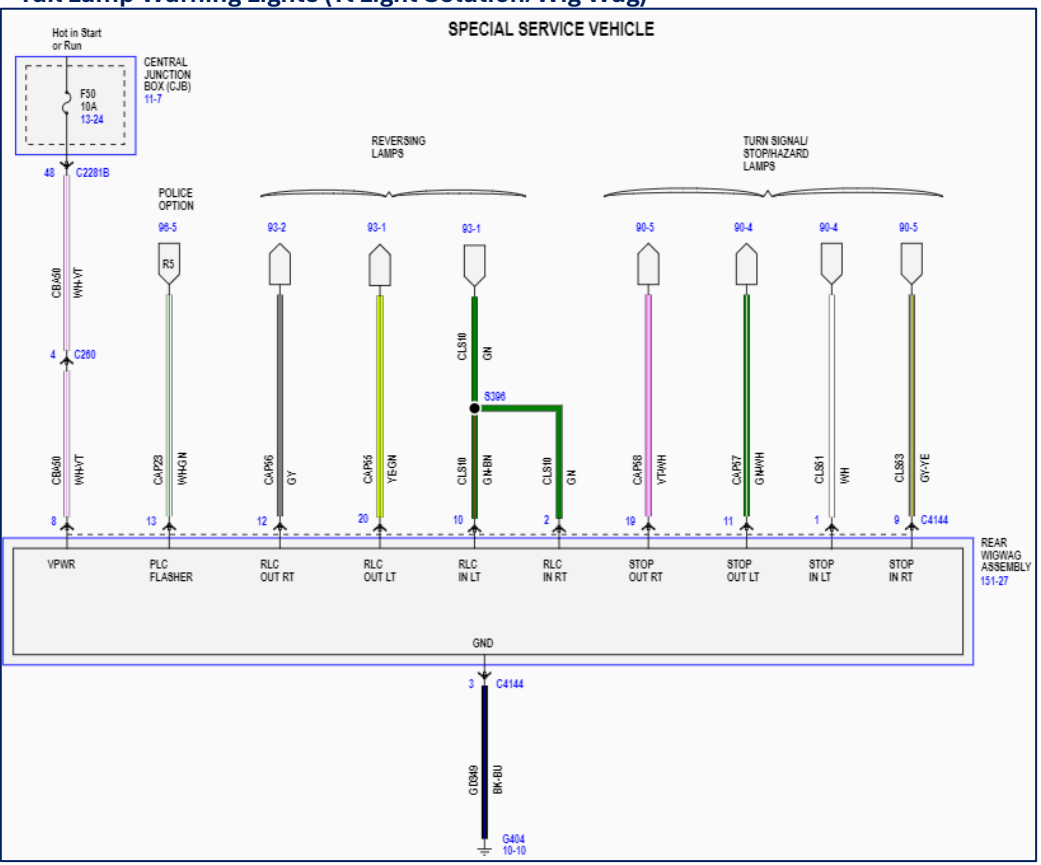
Police Idle Switch - Boundary Switch - Ip Illumination



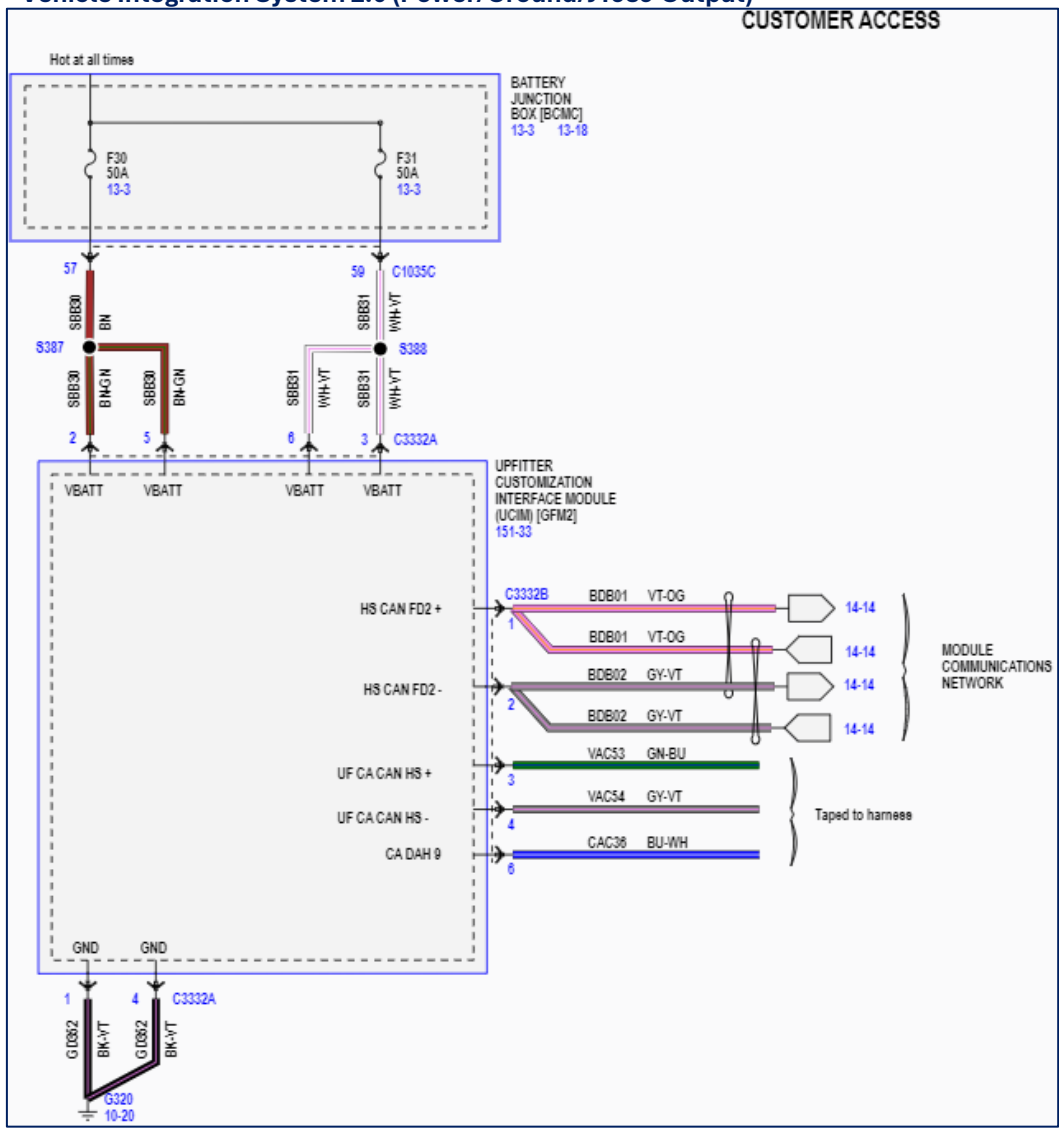
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

Tail Lamp Warning Lights (Tl Light Solution/Wig Wag)



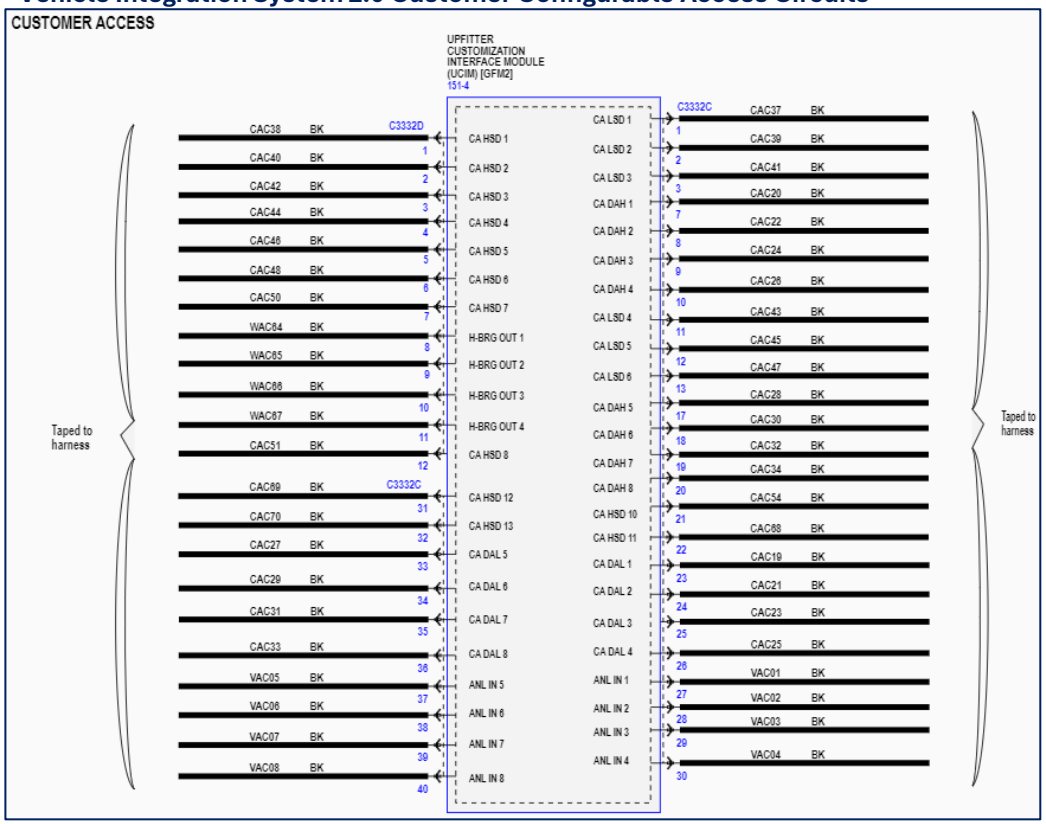
Vehicle Integration System 2.0 (Power/Ground/J1939 Output)



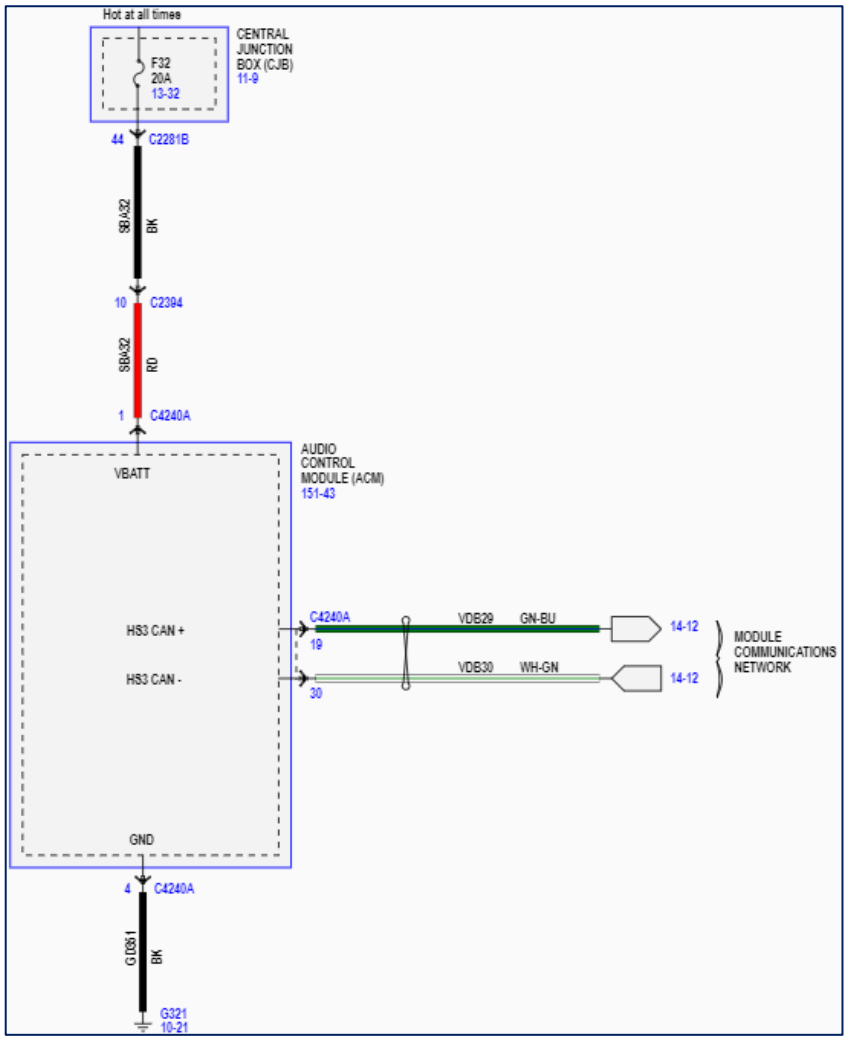
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

Vehicle Integration System 2.0 Customer Configurable Access Circuits



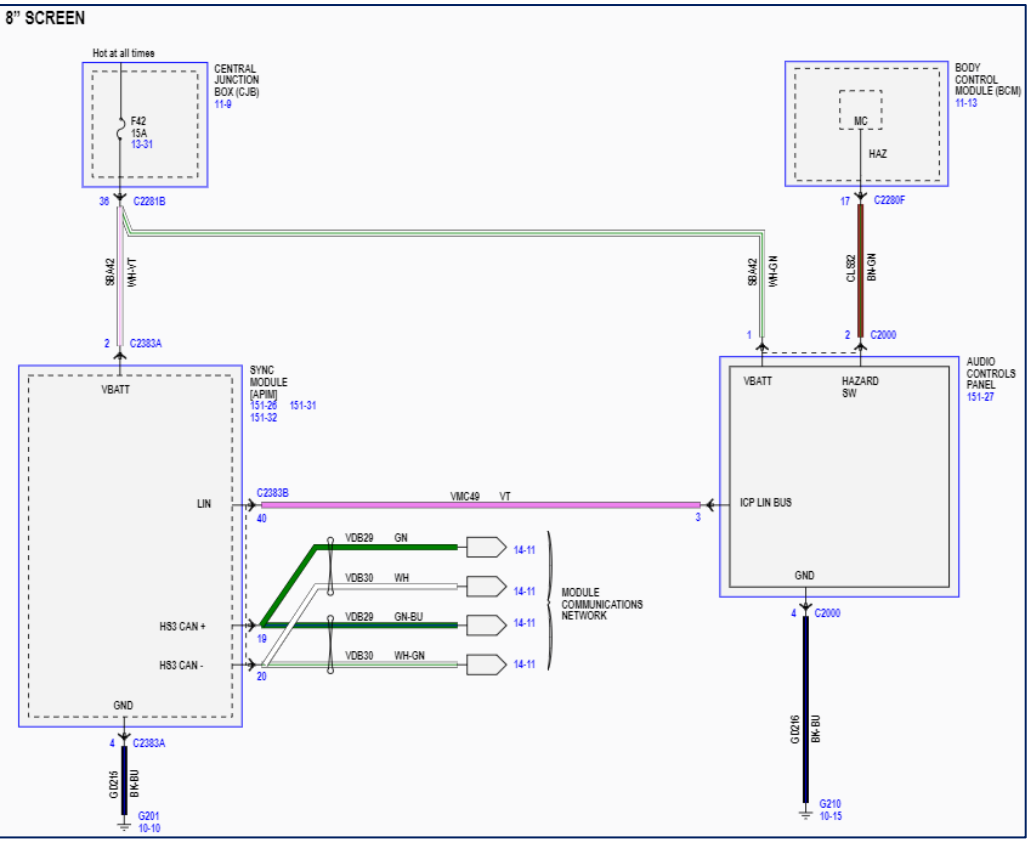
Audio Control Module



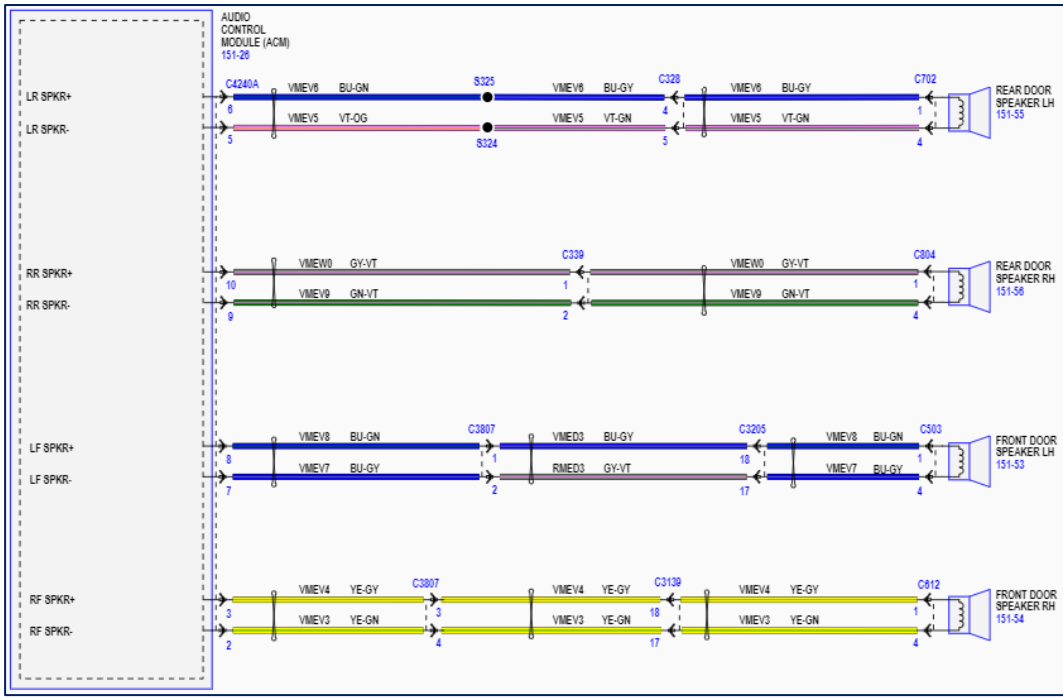
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

8" Display Screen/Audio Control



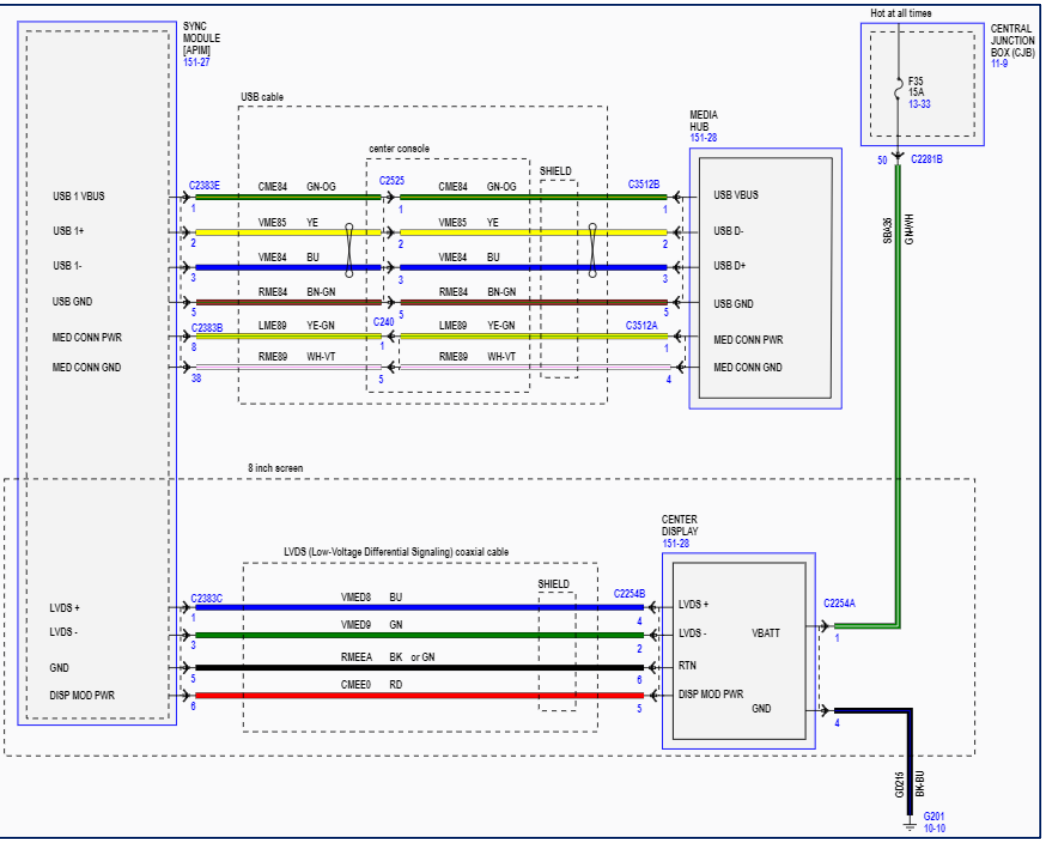
Audio Front And Rear Speaker



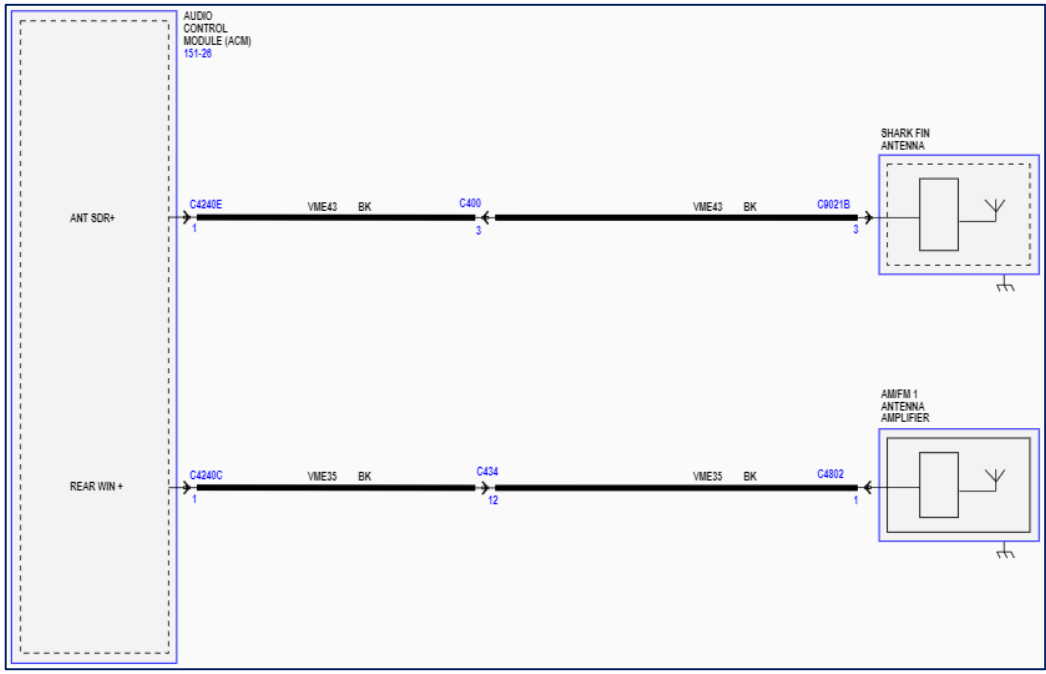
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

USB Interface



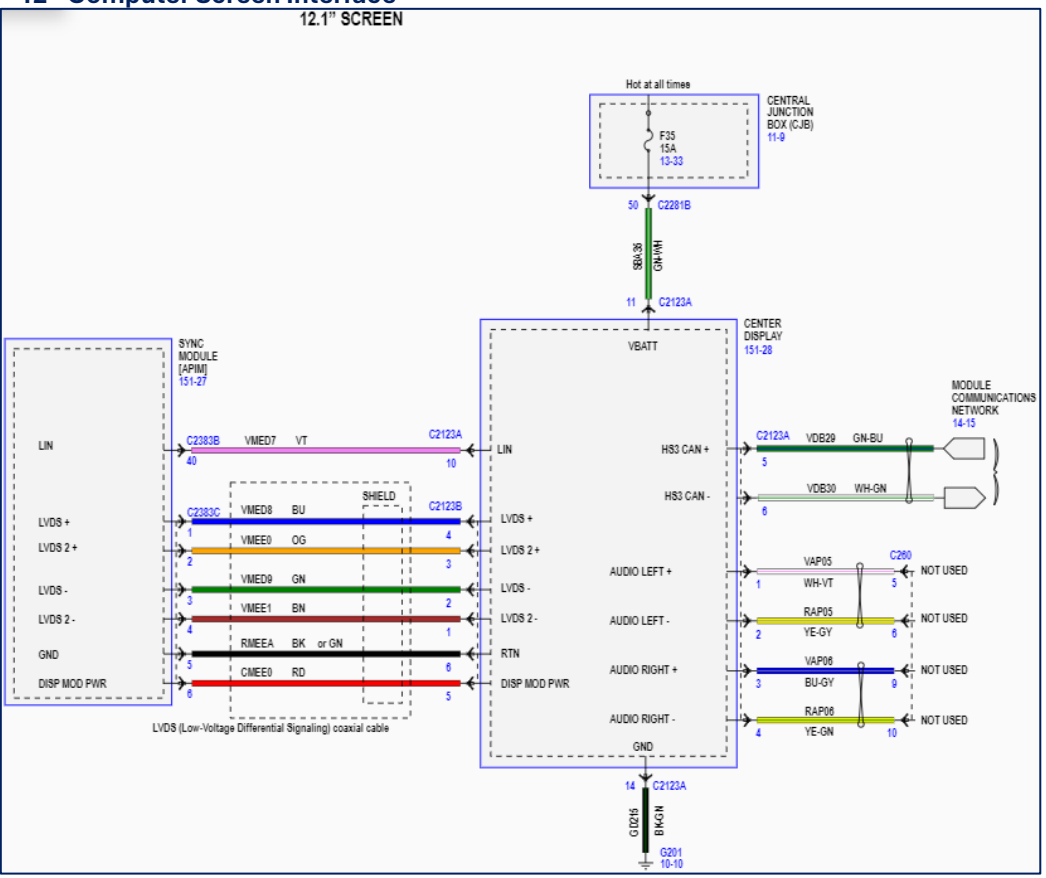
GPS And Audio Antenna



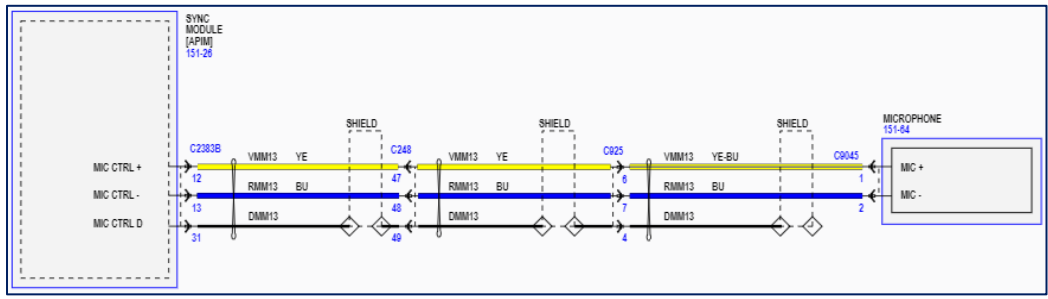
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

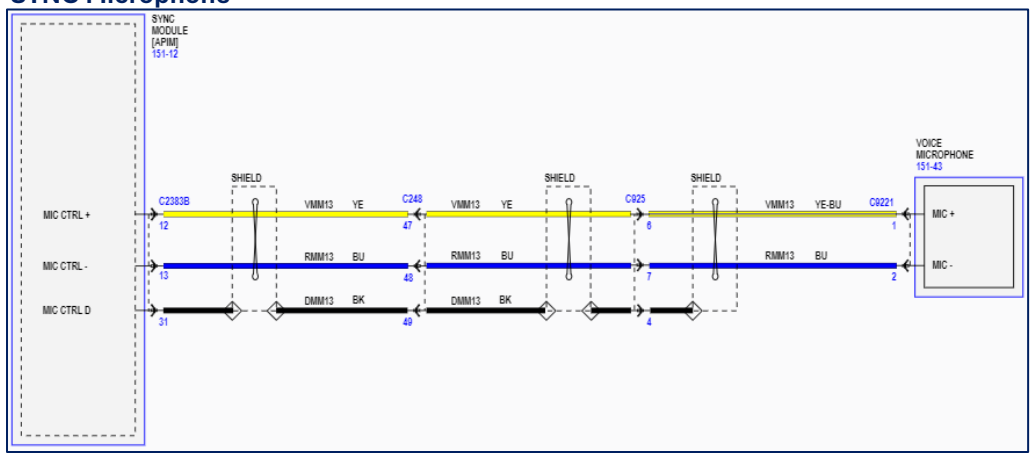
12" Computer Screen Interface



SYNC Microphone



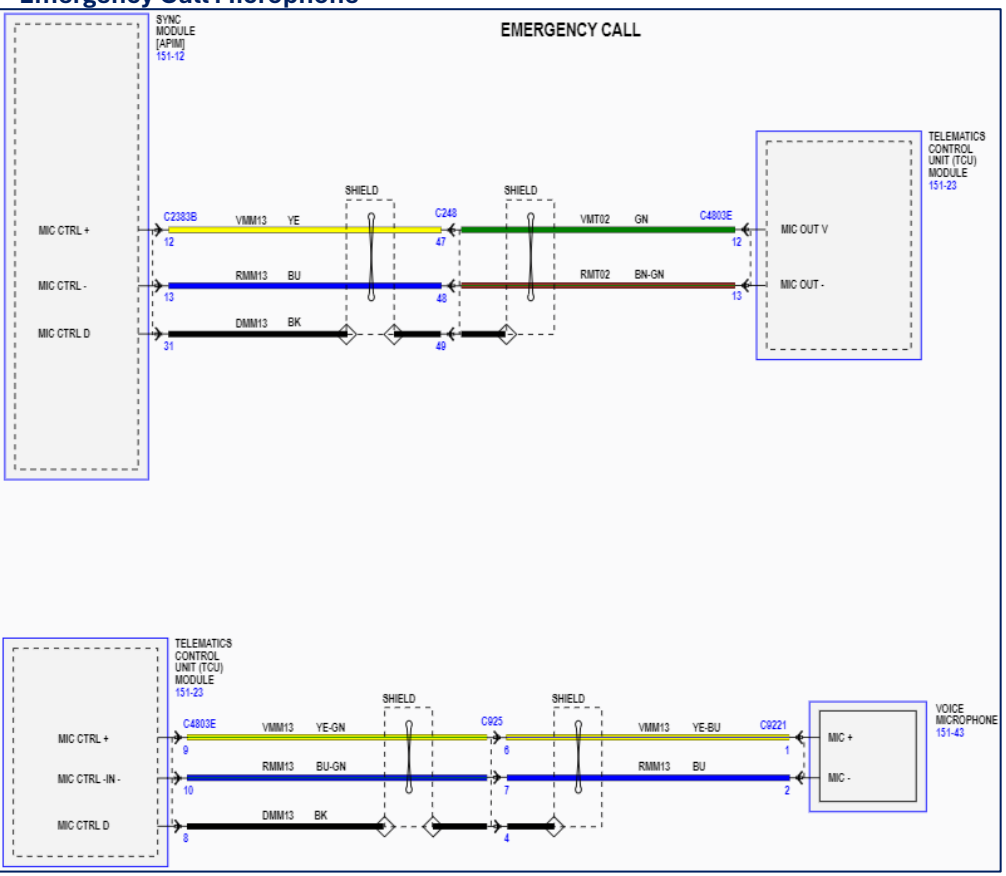
SYNC Microphone



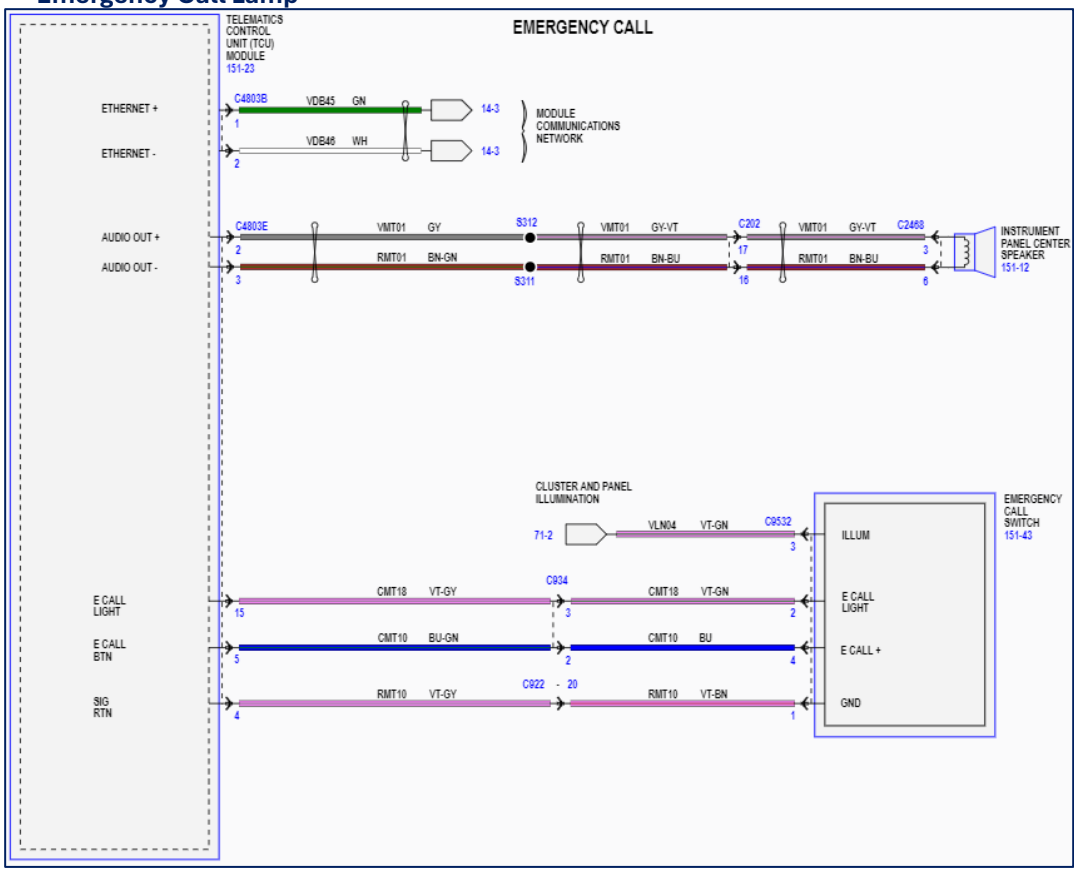
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

Emergency Call Microphone



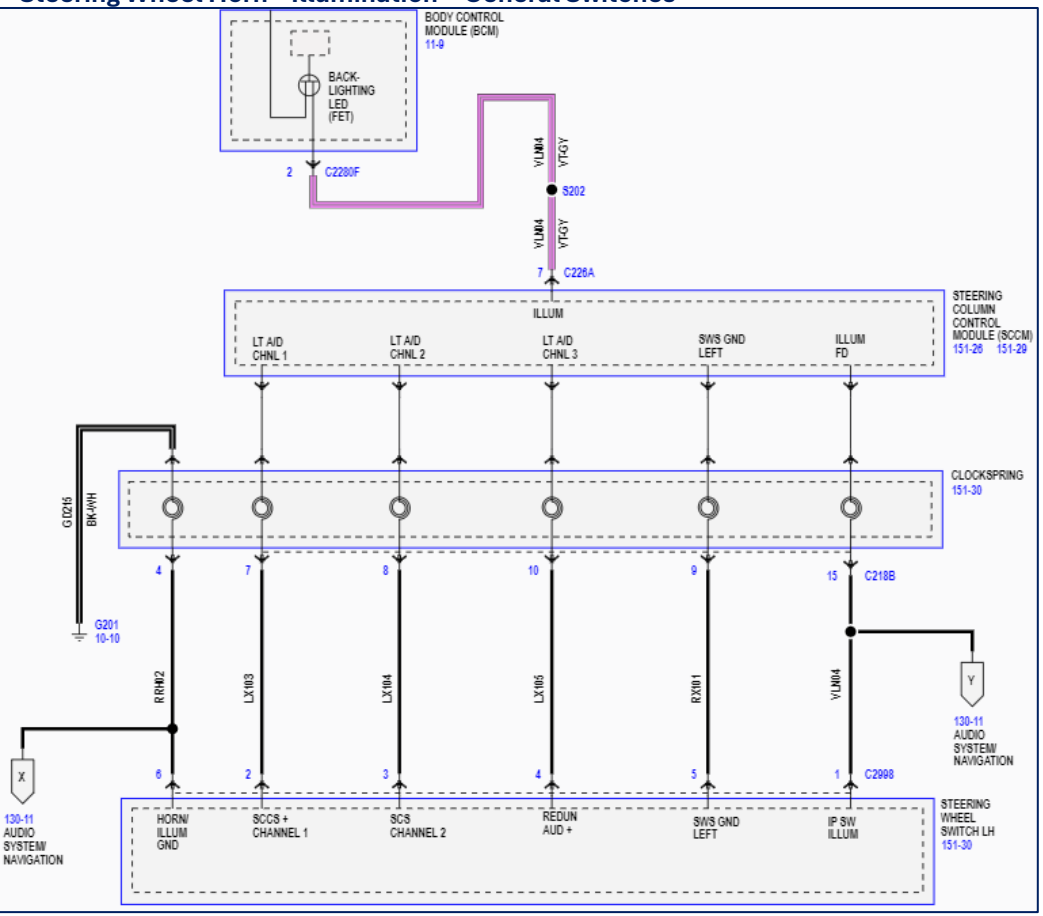
Emergency Call Lamp



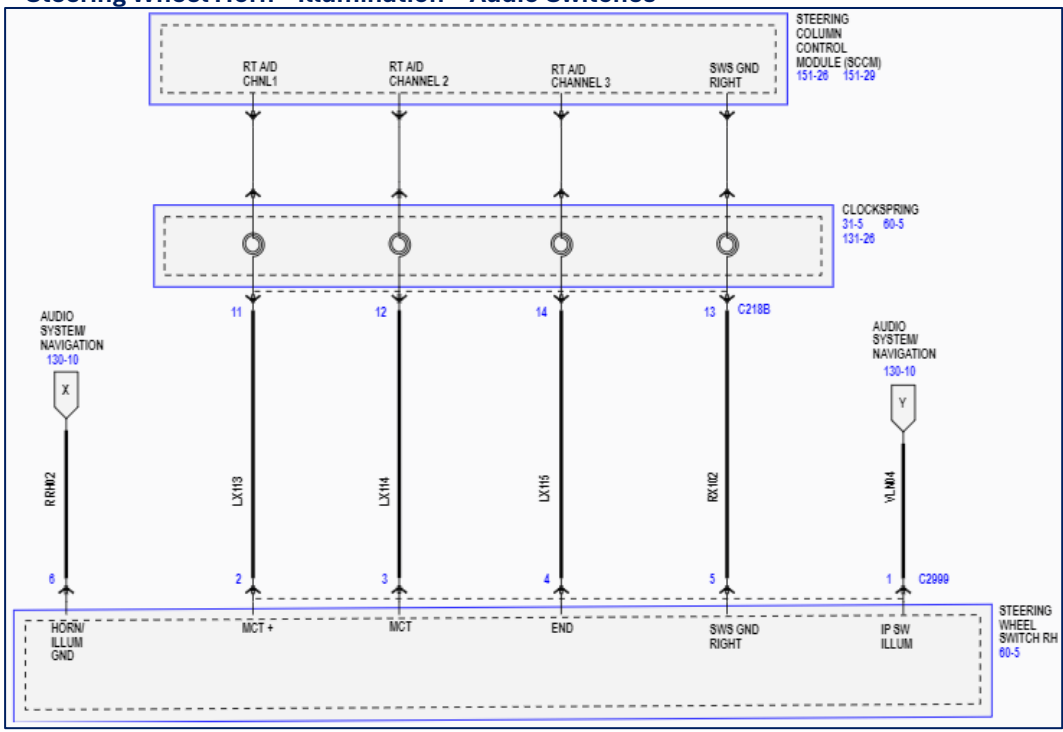
For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

Steering Wheel Horn – Illumination - General Switches



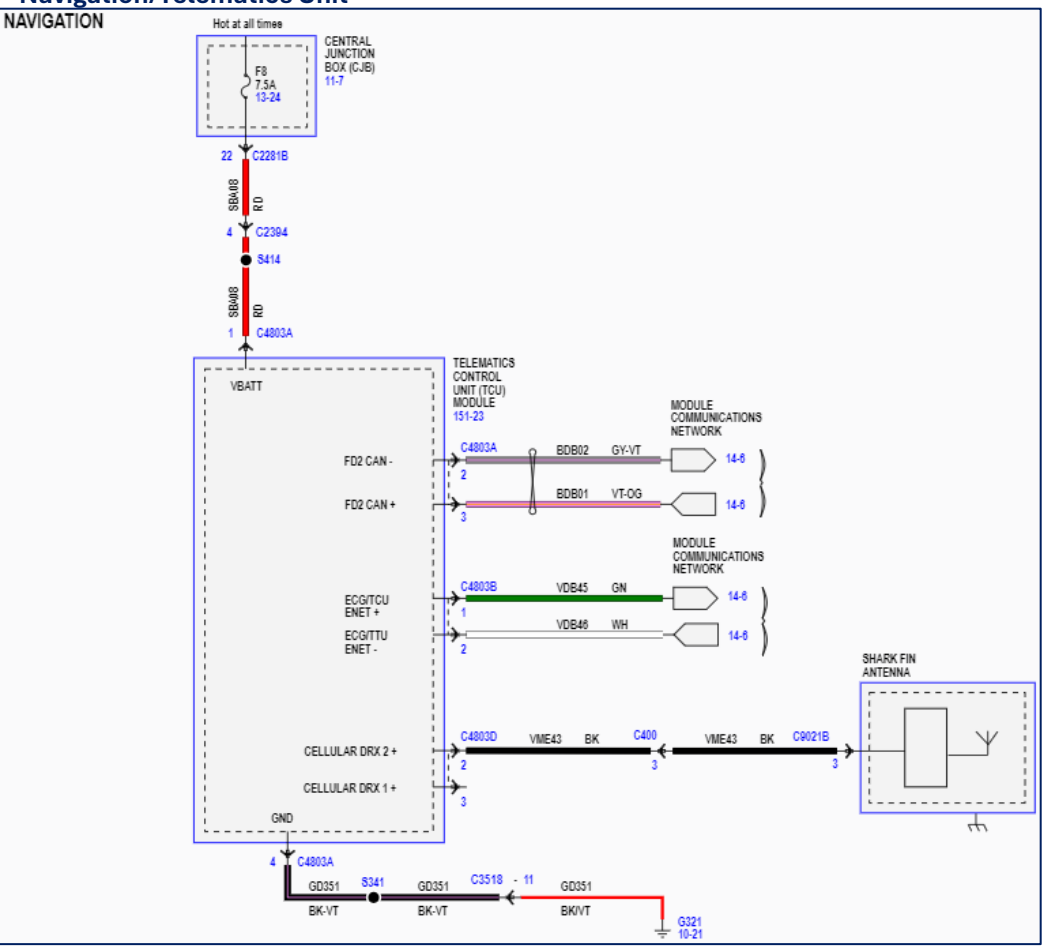
Steering Wheel Horn – Illumination - Audio Switches



For detailed schematics, please visit: https://www.motorcraftservice.com/

WIRE DIAGRAM (Cont'd)

Navigation/Telematics Unit



For detailed schematics, please visit: https://www.motorcraftservice.com/

POLICE MODIFIER GUIDE

SECTION 2 – GENERAL ELECTRICAL INFORMATION

FORD PRO - VEHICLE INTEGRATION SYSTEM 2.0

POLICE BULLETIN P-036
(https://api.pd01e.gcp.ford.com/pro/bbas/download/PMB/65ef09f4d8bd272131bd7098)
FORD PRO - VEHICLE INTEGRATION SYSTEM 2.0
2025MY POLICE INTERCEPTOR UTILITY
Models Affected:
- 2025MY and Beyond Police Interceptor Utility

Description / Overview:
Introduced for the Police Interceptor Utility, the new Ford Pro Vehicle Integration System 2.0 allows for Upfitter(s) to install or operate vocational upfits. This hardware/software solution allows to seamlessly integrate equipment on the truck. Upfitters with a FIN code can sign in and begin using the Vehicle Integration System 2.0 software by click on this link: https://www.fordpro.com/en-us/upfit/vehicle-integration-system-v2/) .

The Vehicle Integration System 2.0 consists of a Vehicle Integration System 2.0 hardware module that allows upfitters to access the vehicle J1939 Control Area Network (CAN) signals of a Vehicle Integration System 2.0 equipped Police Interceptor Utility, and digitally connect the upfit to the vehicle. The upfitters can then use the cloud connected Upfit Logic Editor to program physical switches, digital SYNC soft buttons, and alerts inside the cab. The common interface of the Vehicle Integration System 2.0 allows upfitters to deliver custom, consistent, and repeatable solutions to their customers.

Two-way communication between vehicle and the upfit becomes more streamlined and reliable. Peripheral devices – such as light bars, sirens, etc. – can be directly connected and controlled from soft buttons within the Ford SYNC screens.** Vehicle Integration System 2.0 can be used to program dynamic interlocks that can help protect both equipment and crew.
(** Don't drive while distracted or while using handheld devices. Use voice-operated systems when possible. Some features may be locked out while the vehicle is in gear. Not all features are compatible with all phones.)

Vehicle Integration System 2.0 equipped Police Interceptor Utility come from the factory ready to be upfit. This means no incremental hardware solutions from aftermarket suppliers, no more splicing into factory wiring harnesses, and no more running out of switches inside the cab. Instead, Vehicle Integration System 2.0 allows you to reduce the need to stock hardware while greatly expanding functionality.

Vehicle Integration System 2.0 – Information & Support:
This UIS website https://www.fordpro.com/en-us/upfit/vehicle-integration-system-v2/ will provide information and support for fleet and upfitter communities with information about the Ford Vehicle Integration System 2.0. Below is a sampling of information that is available:
- Vehicle Integration System 2.0 Logic Software: Downloading the latest software version of the Ford Pro Vehicle Integration System 2.0 to begin customizing your vehicles.
- Add VINs: Add VINs to deploy logic to vehicles. Once the VINs are added, the logic can be transferred to multiple vehicles.
- Quick Start Guide: Step-by-step guide to get you started with the logic software.
- Features & Signals: An overview of features, different input, and output signals on the Vehicle Integration System 2.0 (including CAN), and a summary of the different types of logic blocks available. (J1939 CAN Read Signals, Logic Operators, SYNC Integration, and CAN write Signals)
- Introductory Training: A detailed guide for getting started. This includes an overview of the logic tool functionality and examples illustrating the creation of logic.
- FAQs: Hardware/Software/Network Requirements, Vehicle Cable Connectivity, etc.

Ford Pro Vehicle Integration System 2.0 Access:
To obtain access to the information shown above, the upfitter/final stage manufacturer will need to have a valid (approved) Fleet Identification Number (FIN) and username/password. ***If you are experiencing website Log/Sign-In issues OR need to validate and/or have questions about your upfitter FIN code please contact the Ford Pro Contact Center of Excellence (Ford Pro CCoE) at 1-800-34-FLEET (1-800-343-5338), Select 'Option 2'. This is a 24/7 Assistance Hotline.***
If you do not have a valid FIN, please contact 1-800-34-FLEET (1-800-343-5338).

Electrical Overview:
IMPORTANT – Police Interceptor Utility have a new electrical architecture and includes CAN encryption. The new electrical architecture will no longer use the Gateway Module/OBDII connector, instead it will have a central gateway module connecting all the networks and provide channels via the standalone OBDII connector for diagnostic commands. CAN networks are no longer available from the OBDII connector.

Vehicle Integration System 2.0 Module - Power On/Off Strategy:
Vehicle Integration System 2.0 Module is always powered during 'Key-On' and 'Accessory' modes – Module will be 'wakened' in a maximum of 5 seconds and/or 'asleep' in coordination with the vehicle network systems (approximately 5 – 10 minutes). In 'Key-Off' mode, the Module will not transmit any constant signal(s).
- WAKE FUNCTION: The 'wake' conditions are of two types:
  - a soft interruption (network management call from CAN) and
  - a circuit stimulation (any change of state inputs).
- ASLEEP FUNCTION: The trigger to go to sleep is based on the network management call from CAN network, this is dependent on conditions required for the module to sleep and/or 'Key-Off' mode.

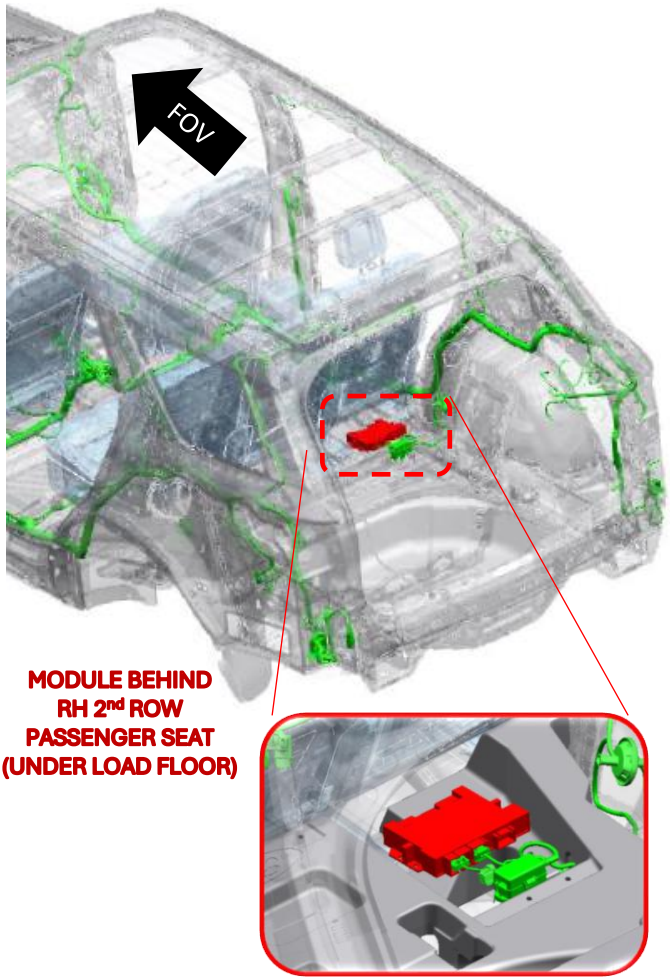
POLICE MODIFIER GUIDE

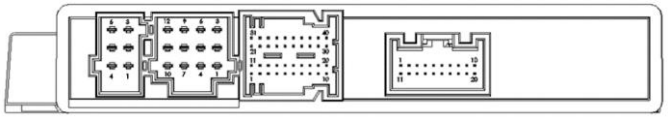
SECTION 2 – GENERAL ELECTRICAL INFORMATION

FORD PRO - VEHICLE INTEGRATION SYSTEM 2.0 *(Cont'd)*

Vehicle Integration System 2.0 Module - Location:
(Equipped From Factory)

Reference the following images on the location of the Vehicle Integration System 2.0 Module for Police Interceptor Utility.
NOTE: Functionality will be provided via the Ford Provided pigtail harness/blunt cut-jumper.





Reference - Vehicle Integration System 2.0 Module Connector View

Vehicle Integration System 2.0 Module - J1939 Output Signals:

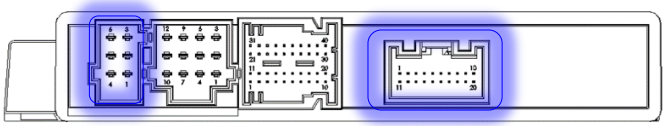
Below is the list of currently available J1939.

- ABS Active
- Ambient Air Temperature
- Air Conditioner Compressor
- Accelerator Pedal Position
- HVAC Recirculation Switch
- Battery Current
- Battery Voltage
- Battery Temperature
- Brake Switch
- Battery State Of Charge
- Cruise Control Mode
- Day Running Light
- Door 1 Status
- Hood Status
- Door 2 Status
- Door 3 Status
- Door 4 Status
- Door 5 Status
- MIL Lamp
- Emergency Light Siren
- Engine Status
- Engine Speed
- Engine Coolant Temperature
- Engine Oil Temperature
- Powertrain Status
- First Row Driver Buckle Status
- First Row Passenger Buckle Status
- Front Fog Light Status
- Rear Fog Light Status
- Fuel Level Percentage
- Oil Transmission Temperature
- Neutral Gear
- Current Gear
- Select Gear
- Four Auxiliary Steering Wheel Switches (Police Interceptor Utility ONLY)
- Day
- Hours
- Minutes
- Seconds
- Year
- Headlamp Low Switch Status
- Headlamp High Switch Status
- Headlamp Light Switch Status
- Front Blower Speed
- Ignition Status
- Man Rgen Soot
- Max Defroster Switch Status
- Odometer Master Value
- Oil Pressure Warning
- Perimeter Alarm Status
- Park Brake Switch Status
- Park Brake Status
- Park Light Headlamp Status
- Regenerative Braking Status
- Second Row Passenger Buckle Status
- Second Row Driver Buckle Status
- Second Row Driver Middle Buckle Status
- Second Row Middle Buckle Status
- Second Tow Passenger Middle Buckle Status
- Steering Wheel Angle
- Stop Lamp Brake Request
- Third Row Driver Buckle Status
- Third Row Middle Buckle Status
- Third Row Passenger Buckle Status
- Tire Pressure
- Park System
- Left Turn Light Status
- Right Turn Light Status
- Hazard Light Switch Status
- Police Idle Status
- Vehicle Inhibit Motion
- Auxiliary Digital Input 1 Status

Vehicle Integration System 2.0 Module - J1939 Output Signals: *(Cont'd)*

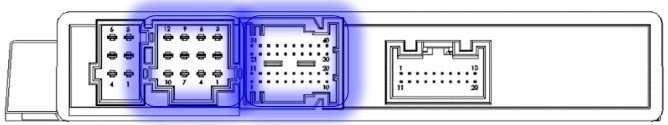
- Auxiliary Digital Input 2 Status
- Auxiliary Digital Input 3 Status
- Auxiliary Digital Input 4 Status
- Auxiliary Digital Input 5 Status
- Auxiliary Digital Input 6 Status
- Auxiliary Digital Input 7 Status
- Auxiliary Digital Input 8 Status
- Auxiliary Digital Input 9 Status
- Auxiliary Digital Input 10 Status
- Auxiliary Digital Input 11 Status
- Auxiliary Digital Input 12 Status
- Auxiliary Digital Input 13 Status
- Auxiliary Digital Input 14 Status
- Auxiliary Digital Input 15 Status
- Auxiliary Digital Input 16 Status
- Auxiliary Digital Output 1 Status
- Auxiliary Digital Output 2 Status
- Auxiliary Digital Output 3 Status
- Auxiliary Digital Output 4 Status
- Auxiliary Digital Output 5 Status
- Auxiliary Digital Output 6 Status
- Auxiliary Digital Output 7 Status
- Auxiliary Digital Output 8 Status
- Automatic Engine Idle Shutdown Override
- Wheel Based Vehicle Speed
- Vehicle Identification Number
- Acceleration Rate
- Long Rate
- Roll Rate
- Vertical Rate
- Yaw Rate
- Front Wiper Switch Status

Vehicle Integration System 2.0 Module - J1939 Output Customer Can-signal Access:



1. Vehicle Integration System 2.0 Module Location: (Reference images on previous page)
   a. Police Interceptor Utility - RH Side, Behind 2nd row passenger seat (Under Load Floor)
2. Disconnect both the Black 20-Way and Blue 6-Way from the module to ensure no power is being delivered to module. (Reference respective Police Modifier Guides for circuits/pin-outs details.)
3. The Black 20-Way circuits will be used to access the J1939 signals. Focusing on the Black 20-Way connector, carefully begin to unravel/unwrap the flocked tape around the harness such that enough workable length is available to expose the wire circuits. Stow away the unraveled/unwrapped flock tape so it can be reused for re-installation later.
4. Locate the J1939 wired circuits 3 & 4 (wire 3 CAN '+' GN/BU & wire 4 CAN ' – ' GY/BU). These 2 circuits will be used in order to perform the cut and splice to obtain the signals.
   NOTE: The circuits remaining in the harness will not be used and no longer need to be connected. Recommend taping the circuits back securely and stowed away from the splice.
   NOTE: Follow the Ford approved procedure for soldering circuits to complete the splice. These are CAN network circuits that are a twisted pair, and for the added length ensure it meets the twists per foot requirement (4 twists per 50mm)
5. Complete the splice, following the Ford Repair Guidelines, rewrap the flock tape removed (Step 4) or use an acceptable substitute ensuring that circuits are wrapped within 50mm from the back of the connector.
6. Reconnect the Black 20-way, and Blue 6-way to the Module.
7. Reinstall the Vehicle Integration System 2.0 Module, and glove compartment following the reinstallation procedure outlined by Motorcraft Service, www.motorcraftservice.com .

Vehicle Integration System 2.0 Module - Output Customer Can-signal Access



The following UIS sample list of Channel/Signal Outputs for the 40-Way and 12-Way.

40-WAY PINOUT (PU5T-14489 MA)

Cavity	Circuit	Color	Alt. Name	Signal Name	Description
1	CAC37A	YE/GN	LSD 1	MFA_15	LS Switch Output 0.5A, PWM
2	CAC39A	YE/VT	LSD 2	MFA_16	LS Switch Output 0.5A, PWM
3	CAC41A	GY/BN	LSD 3	MFA_13	LS Switch Output 1A, PWM
4	-	-	-	-	-
5	-	-	-	-	-
6	-	-	-	-	-
7	CAC20A	BU/GN	DAH 1	MFE_17	Digital Input, high active
8	CAC22A	GN/WH	DAH 2	MFE_19	Digital Input, high active
9	CAC24A	BU/GY	DAH 3	MFE_21	Digital Input, high active
10	CAC26A	GN/VT	DAH 4	MFE_23	Digital Input, high active
11	CAC43A	VT/GY	LSD 4	MFA_17	LS Switch Output 0.5A, PWM
12	CAC45A	WH/VT	LSD 5	MFA_18	LS Switch Output 0.5A, PWM
13	CAC47A	VT/OG	LSD 6	MFA_14	LS Switch Output 1A, PWM
14	-	-	-	-	-
15	-	-	-	-	-
16	-	-	-	-	-
17	CAC28A	BU/BN	DAH 5	MFE_18	Digital Input, high active
18	CAC30A	YE/BU	DAH 6	MFE_20	Digital Input, high active
19	CAC32A	GN/OG	DAH 7	MFE_22	Digital Input, high active
20	CAC34A	GN	DAH 8	MFE_24	Digital Input, high active
21	CAC54A	BN/GN	HSD 10	MFA_11	HS Switch Output 0.5A, PWM, Supply_2
22	CAC68A	BN/YE	HSD11	MFA_12	HS Switch Output 0.5A, PWM, Supply_2
23	CAC19A	BU	DAL 1	MFE_9	Digital Input, low active
24	CAC21A	GY	DAL 2	MFE_11	Digital Input, low active
25	CAC23A	GY/YE	DAL 3	MFE_13	Digital Input, low active
26	CAC25A	VT/WH	DAL 4	MFE_15	Digital Input, low active
27	VAC01A	WH/BN	ANL IN 1	MFE_1	Analog Input
28	VAC02A	GY/OG	ANL IN 2	MFE_3	Analog Input
29	VAC03A	WH/OG	ANL IN 3	MFE_5	Analog Input
30	VAC04A	YE	ANL IN 4	MFE_7	Analog Input
31	CAC69A	BU/GN	HSD 12	MFA_9	HS Switch Output 0.5A, PWM, Supply_1
32	CAC70A	VT/GN	HSD 13	MFA_10	HS Switch Output 0.5A, PWM, Supply_1
33	CAC27A	WH/GN	DAL 5	MFE_10	Digital Input, low active
34	CAC29A	GY/VT	DAL 6	MFE_12	Digital Input, low active
35	CAC31A	VT/BN	DAL 7	MFE_14	Digital Input, low active
36	CAC33A	GY/BU	DAL 8	MFE_16	Digital Input, low active
37	VAC05A	GN/BN	ANL IN 5	MFE_2	Analog Input
38	VAC06A	YE/VT	ANL IN 6	MFE_4	Analog Input
39	VAC07A	BN/BU	ANL IN 7	MFE_6	Analog Input
40	VAC08A	YE/OG	ANL IN 8	MFE_8	Analog Input

SECTION 2 – GENERAL ELECTRICAL INFORMATION

Vehicle Integration System 2.0 Module - Output Customer Can-signal Access *(Cont'd)*

12-WAY PINOUT (PU5T-14489-LA)					
Cavity	Circuit	Color		Signal Name	Description
1	CAC38A	BU/BN		MFA_7	HS Switch Output 5A, Supply_2
2	CAC40A	BN/GN		MFA_5	HS Switch Output 5A, Supply_1
3	CAC42A	WH/BN		MFA_6	HS Switch Output 5A, Supply_1
4	CAC44A	WH/OG		MFA_8	HS Switch Output 5A, Supply_2
5	CAC46A	GY/OG		MFA_4	HS Switch Output 10A, Supply_2
6	CAC48A	WH/GN		MFA_1	HS Switch Output 5A, Supply_1
7	CAC50A	VT/GN		MFA_3	HS Switch Output 5A, Supply_2
8	WAC64A	BU		MFA_20	HB_1 Output 5A, Supply_1
9	WAC65A	YE/GY		MFA_19	HB_1 Output 5A, Supply_1
10	WAC66A	VT/BN		MFA_22	HB_2 Output 5A, Supply_2
11	WAC67A	GN/VT		MFA_21	HB_2 Output 5A, Supply_2
12	CAC51A	BU/OG		MFA_2	HS Switch Output 10A, Supply_1

For every input into Vehicle Integration System 2.0 Module, the voltage range must be within the recommend minimum and maximum range, refer to the Ford Pro™ | Commercial Fleet Vehicles, Services & Telematics website, https://www.fordpro.com/en-us/upfit/uis .

For every Pulse Width Modulation (PWM), the maximum and minimum frequencies should be within the recommended high and low amperage outputs, refer to the Ford Pro website, https://www.fordpro.com/en-us/upfit/uis .

NOTE: UIS Grounding - recommendation is that the UIS must be grounded up to 40 Amps, and additional grounds to be routed/connected to chassis/frame. IT IS NOT RECOMMENDED TO UTILIZE EXISTING OEM GROUNDS, follow recommended grounding guidelines in General Body Builder Layout Book or www.motorcraftservice.com).

NOTE: During vehicle cranking and/or stop-start function, the voltage may drop below 9-Volts, 1. Vehicle Integration System 2.0 Feature will momentarily become interrupted (pause in functionality), until the voltage is recovered and Vehicle Integration System 2.0 Feature will resume.

If you have any questions, please contact the Ford Body Builders Advisory Service

HIGH VOLTAGE BATTERY DEPOWERING

WARNING: The high-voltage system may retain a dangerous level of voltage for a short time after the service disconnect has been opened. Wait 5 minutes for the voltage to dissipate before beginning service. Failure to follow this instruction may result in serious personal injury or death.

WARNING: Removing the battery high voltage service disconnect does not dissipate voltage inside the battery pack. The battery pack remains live and dangerous. Contact with the high voltage battery pack internals may result in serious personal injury or death.

WARNING: Electric vehicles damaged by a crash may have compromised high voltage safety systems and present a potential high voltage electrical shock hazard. Exercise caution and wear appropriate personal protective equipment (ppe) including high voltage safety gloves and boots. Remove all metallic jewelry, including watches and rings. Isolate the high voltage system as directed by the ford emergency response guide for the vehicle. Failure to follow these instructions may result in serious personal injury or death.

WARNING: To prevent the risk of high-voltage shock, always follow precisely all warnings and service instructions including instructions to depower the system. The total voltage of the vehicle hv battery pack may be up to approximately 450 volts dc. This voltage is provided through high-voltage cables to its components and modules. The high-voltage cables and wiring are identified by orange harness tape or orange wire covering. All high-voltage components are marked with high-voltage warning labels with a high-voltage symbol. Failure to follow these instructions may result in serious personal injury or death.

WARNING: Service of the high voltage system on this vehicle is restricted to qualified personnel. The required qualifications vary by region. Always observe local laws and legislative directives regarding electric vehicle service. Failure to follow this instruction may result in serious personal injury or death.

WARNING: Never connect the service disconnect when a high-voltage cover is removed. Always install the cover prior to connecting the service disconnect. The cover prevents inadvertent contact with the high voltage which is present at several points under the cover. Failure to follow these instructions may result in serious personal injury or death.

WARNING: Disconnect the 12v battery before servicing the direct current to alternating current (dc-ac) inverter or alternating current (ac) powerpoint to prevent the risk of high voltage shock. Failure to follow this instruction may result in serious personal injury.

NOTICE: Do not back probe, splice or repair the high voltage (orange) wiring. Voltage in the system is approximately 450 volts DC. Damage may occur to equipment added to the system.

NOTICE: None of the High Voltage Traction Battery (HVTB) wiring should be tapped or spliced to check for battery voltage (power), ground or signals.

NOTICE: Modification of Low-Voltage (LV) power & control wires connecting to the High-Voltage (HV) battery system can damage or disable the HV Battery system. Do not open or modify High Voltage battery pack.

High Voltage Battery Depowering using FDRS.

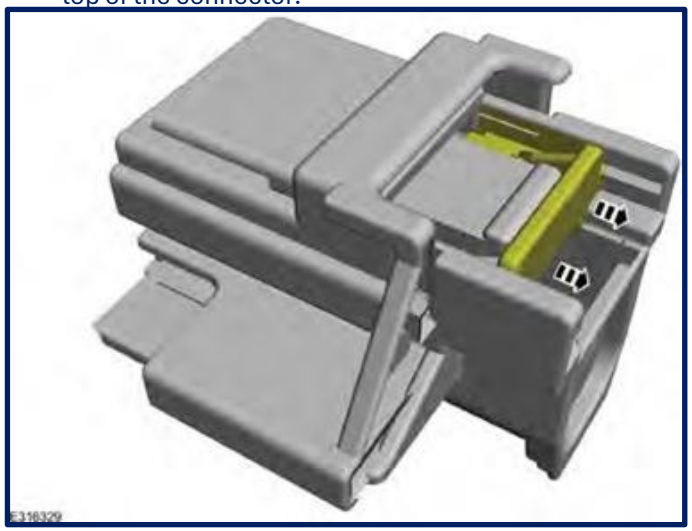
WARNING: Before beginning any service procedure in this manual, refer to health and safety warnings in Workshop Manual (WSM) Section 100-00 General Information. Failure to follow this instruction may result in serious personal injury.

High Voltage Battery Depowering using FDRS. *(Cont'd)*

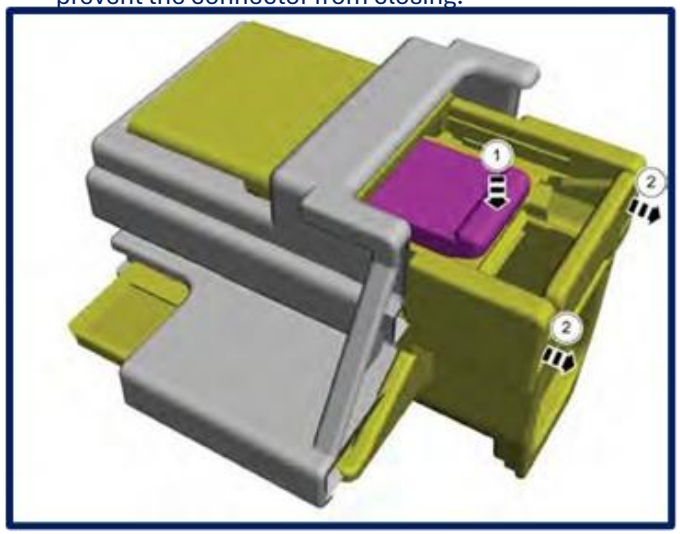
WARNING: To prevent the risk of high-voltage shock, always follow precisely all warnings and service instructions, including instructions to depower the system. The high-voltage system utilizes approximately 450 volts DC, provided through high-voltage cables to its components and modules. The high-voltage cables and wiring are identified by orange harness tape or orange wire covering. All high-voltage components are marked with high-voltage warning labels with a high-voltage symbol. Failure to follow these instructions may result in serious personal injury or death.

1. Using the FDRS CARRY OUT the Zero Voltage Confirmation routine and follow the on-screen instructions.
2. Detach the pin-type retainer and position the electrical connector and wiring harness aside.
3. Release the Connector Position Assurance (CPA) clip.

4. NOTE: The tab must be depressed prior to pushing the connector back in or damage to the connector may result. Depress the tab while pulling the connector until the hole is completely visible on the top of the connector.



5. Insert a suitable tool inside the connector hole to prevent the connector from closing.



6. Using the FDRS COMPLETE the Zero Voltage Confirmation routine and verify the High Voltage System has been de-energized.

Manual De-Energizing

WARNING: To prevent the risk of high-voltage shock, always follow precisely all warnings and service instructions, including instructions to depower the system. The high-voltage system utilizes approximately 450 volts DC, provided through high-voltage cables to its components and modules. The high-voltage cables and wiring are identified by orange harness tape or orange wire covering. All high-voltage components are marked with high-voltage warning labels with a high-voltage symbol. Failure to follow these instructions may result in serious personal injury or death.

WARNING: Before beginning any service procedure in this manual, refer to health and safety warnings in WSM Section 100–00 General Information. Failure to follow this instruction may result in serious personal injury.

Manual De-Energizing *(Cont'd)*

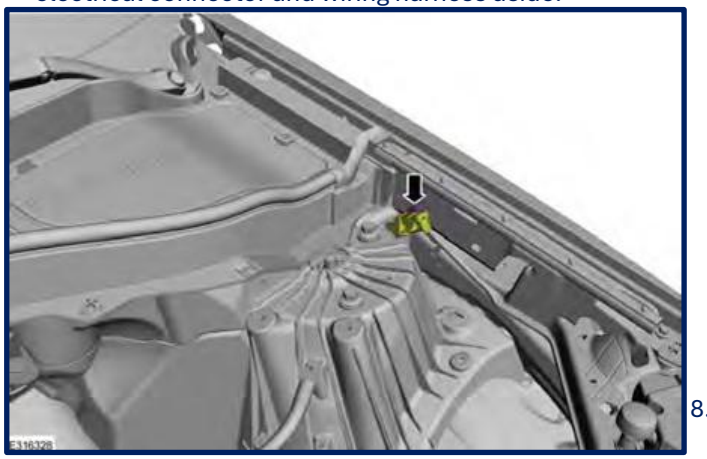
NOTICE: Manual De-energization should only be performed when a Ford-specific diagnostic tool is not available.

NOTICE: Excessive use of this method may cause damage to electrical connectors.

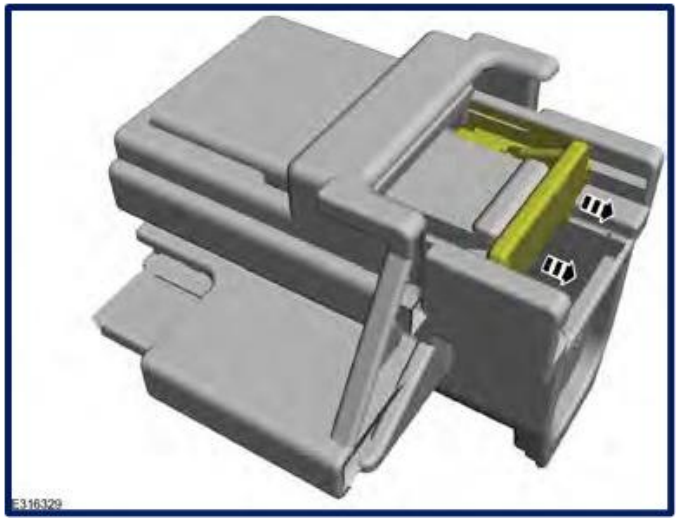
NOTICE: To prevent the risk of high voltage shock, the high voltage battery cover must not be removed if any of the following condition exist:

- BECM DTC P0AA6:00 that has been diagnosed to be an internal fault with the high voltage Battery.
- BECM Diagnostic Trouble Codes (DTCs) P0AA1:00 AND P0AA4:00 are present.
- BECM Diagnostic Trouble Codes (DTCs) P0D0F:00 AND P0AA4:00 are present (PHEV only).

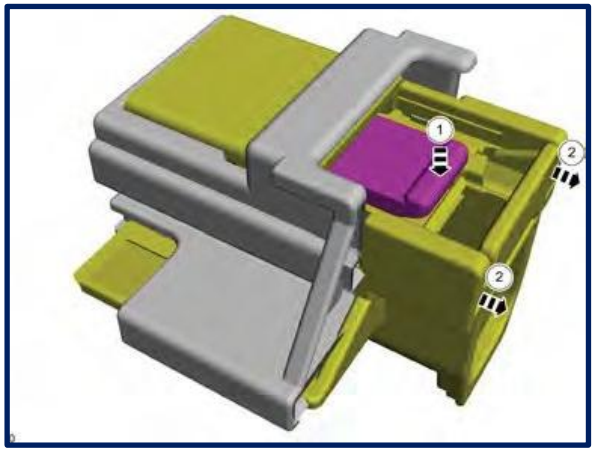
1. Disconnect the Electric Vehicle Supply Equipment (EVSE) from the vehicle charge port. (PHEV only).
2. Turn the ignition ON without depressing the brake pedal (Accessory mode).
3. NOTE A scan tool that is capable of performing a self-test on the BECM is required.
   Using a scan tool perform BECM self-test and record the Diagnostic Trouble Codes (DTCs).
   - If BECM Diagnostic Trouble Codes (DTCs) P0AA1:00 AND P0AA4:00 are present. Refer to WSM procedures in section 414-03 High Voltage Battery, Mounting and Cables, Diagnosis and Testing.
   - If BECM Diagnostic Trouble Codes (DTCs) P0D0F:00 AND P0AA4:00 are present (PHEV only). Refer to WSM Procedures in section 414–03A High Voltage Battery, Mounting and Cables - Plug-In Hybrid Electric Vehicle (PHEV).
4. Turn the ignition OFF.
5. Detach the pin-type retainer and position the electrical connector and wiring harness aside.



6. Release the Connector Position Assurance (CPA) clip.



7. NOTE: The tab must be depressed prior to pushing the connector back in or damage to the connector may result. Depress the tab while pulling the connector until the hole is completely visible on the top of the connector.



8. Insert a suitable tool inside the connector hole to prevent the connector from closing.

9. Disconnect the low voltage electrical connector at the High Voltage Battery.
10. Disconnect the high voltage electrical connector at the High Voltage Battery.
11. Wait a minimum of 5 minutes.

For further detailed instructions, consult https://www.motorcraftservice.com/

POLICE MODIFIER GUIDE

SECTION 3 - INSTALLATION CONSIDERATIONS

PUSH BUMPERS

Ford Motor Company understands it may be desirable to install a push bumper mounted on the front of emergency vehicles. The installation of push bumpers may adversely affect certain safety systems and/or performance aspects of your vehicle. You should consider the following when deciding whether to install a push bumper, the type of push bumper, and the appropriate installation.

Effect on Driver Assist Features
Driver assist features require sensors and cameras to monitor areas around the vehicle. Some push bumper designs may block or restrict the ability of the sensors and cameras to monitor the area around the vehicle. This could prevent the driver assist feature(s) from performing as designed and provide the intended safety benefit.

NOTE: Adaptive Cruise Control (ACC) feature radar projects through the lower fascia, identified in yellow box in the image below.

WARNING: The Push Bumpers cannot obstruct the Adaptive Cruise Control radar 'Field of View'. (See Section 8 for further details.)

Effect on Air Bag Deployment
Different push bumper designs may each have unique deformation characteristics in a crash situation that may or may not affect the deployment of air bags. Without the benefit of crash tests on vehicles equipped with push bumpers (there are a number of different styles available), it is the opinion of Ford Motor Company that installation of some push bumpers could affect the timing of the air bag deployment.

Effect on Weight Distribution
The balance and weight distribution of a vehicle is carefully planned to achieve optimal stability, handling, and braking. Push bumpers can change this weight distribution by adding excessive weight to the front of the vehicle. There are many different styles of push bumpers available. Depending on the mounting and weight of the push bumper to be installed, it could have an adverse effect on the handling of a vehicle. Always verify the vehicle ride height after the addition of a push bumper. Adjust the ride weight if the measurements are not within specifications.

Effect on Air Flow
The powertrain cooling system on a vehicle relies on proper airflow through the radiator to keep the powertrain at its proper operating temperature. When adding a push bumper to a vehicle, make sure this airflow is not obstructed, especially when light and sirens are mounted on the push bumper. Reduced airflow could put additional strain on the cooling system and shorten the operational life of the related components. Elevated temperatures may also result in a reduced performance mode of operation intended to prevent temperature increase that may operate in a reduced power mode. During the installation process, keep the placement of components away from the grille area of the vehicle. For any components mounted in the grille area above the bumper, use factory-installed locations and do not exceed sizing of factory-installed components to maintain required airflow. Do not mount equipment below the bumper in front of the lower front fascia opening.

VEHICLE INTERIOR PARTITION INSTALLATION GUIDELINES

Ford Motor Company understands it may be desirable to install partitions between certain areas inside the vehicle. The installation of partitions may adversely affect certain safety systems and/or occupants and K-9 passengers. You should consider the following when deciding whether to install a partition, the type of partition, and the appropriate installation.

Effect on Air Bag Deployment
Care must be taken when selecting and installing partitions to prevent the partition from restricting the deployment path of air bags, routing of air bag wiring to the air bags and aftermarket police equipment (examples include, lights, siren, radios, antenna, video, etc.) wiring that may use the same routing path and restrict/prevent air bags from deploying. If the partition restricts the deployment path, the air bag may not fully deploy and/or its rate of deployment changed such that it will not provide the designed protection for the vehicle. Damage to the wiring and/or connectors that control the deployment of the air bags may prevent the air bag from deploying either fully or at the intended timing.

SECTION 3 - INSTALLATION CONSIDERATIONS

VEHICLE INTERIOR PARTITIONS *(Cont'd)*

Occupant Protection
For air bags to perform as designed, a vehicle upfit must not affect the as-designed full deployment and timing of deployment. Federal Motor Vehicle Safety Standards (FMVSS) and Canadian Motor Vehicle Safety Standards (CMVSS) provide information regarding occupant area requirements. FMVSS/CMVSS requirements should be consulted when selecting and installing a partition and the occupant area created. Occupant safety can also be affected by contact with a hard surface (i.e., steel, etc.) or with aftermarket partitions and equipment, as a result of, for example, traffic collision, emergency response-type driving conditions, etc.

Occupant Comfort
The design of the partition may affect air flow from the vehicle climate control (heating/cooling) system if air flow inside the vehicle is restricted. Vehicle climate control venting can be considered with the design of the partition for temperature considerations.

Interior Equipment Mounting
WARNING: Interior trim panels should not be used for mounting police equipment.

SEATBELT OPERATION

WARNING: The partition and the installation hardware of the partition must not interfere with the proper operation of the safety belt, safety belt retractor, side impact sensor and the safety belt height adjusters. Failure to follow these instructions may result in personal injury.

SIREN AND GRILL LIGHTS

NOTICE: Do not modify the cooling system. High voltage vehicle components may be damaged if any cooling system modifications are attempted.
The cooling system relies on proper airflow through the radiator to keep components at their proper operating temperature. When adding sirens and grille lights to a vehicle, make sure this airflow is not obstructed. Reduced airflow could put additional strain on the cooling system and shorten the operational life of related components. The cooling system also cools the electric motors and electronics. If the coolant exceeds certain temperatures, the components will attempt to protect themselves by limiting the power and torque available. During the installation process, keep the placement of components away from the grille area of the vehicle.

MOUNTING EQUIPMENT CONSIDERATIONS

- Do not mount equipment to the high voltage (orange) wiring/cables, the high voltage cover or the HVTB cooling plenum.
- Do not mount equipment on the instrument panel between the driver and passenger airbags due to deployment variability.
- Do not mount equipment on the instrument panel between the driver and the pedals, between the door and the console area due to knee airbag deployment variability.
- Do not mount equipment obstructing the HVTB service disconnect located under the hood, LH side of the engine compartment.
- Do not remove or block the HVTB cooling plenum or ducts. These components are necessary for the proper cooling of the HVTB.
- Do not cover any warning or vehicle labels.
- NOTICE: The side impact sensors are tuned to excite based on their mass (including wiring), as well as the host sheet metal. Any alteration to these components must be avoided. Additions such as padding, wire connectors, retainers, tape or fasteners of any kind should not be used. All fasteners in this predominantly sheet metal environment should be made of steel or a non- conductive plastic to guarantee retention and longevity. If any part of a steel fastener is exposed to a wet area, it should be plated to resist corrosion.
- Do not mount equipment to the A, B, C, or D-pillars.
- Do not mount equipment on the headliner within 200 mm (8 in) of the side edges.
- Do not mount equipment above the beltline within 200 mm (8 in) of the side glass from the A-pillar leading edge to the rear edge of the D- pillar.
- Do not mount equipment on the headliner along the siderails.
- Do not install a partition, divider or equipment that spans the vehicle above the beltline.

AIRBAG, SAFETY RESTRAINT SYSTEM AND SIDE IMPACT SENSOR COMPONENT DESCRIPTION AND LOCATION

The safety belt retractors are located in the base of the B-pillars. The pretensioner located in the retractor is referred to as the safety belt retractor pretensioner. In the event the Restraints Control Module (RCM) senses an impact, pretensioners provide improved occupant protection by rapidly removing slack from the safety belt. Removing slack from the safety belt helps to properly position the occupant and allows for maximum effectiveness of the safety belts and the airbags.

- Do not use the safety belt retractor bolts for mounting the partition.
- Do not mount any partition hardware on the inboard side of the B-pillar within the bottom 305 mm (12 in).
- Do not mount any partition hardware that will interfere with the proper sealing of the door.
- Do not mount any police hardware to block and/or reduce the design intent function of driver safety systems such as auto emergency braking camera if equipped.

NOTE: The effectiveness of all safety system sensing equipment should be reviewed during the upfit process to ensure design intent function.

The side impact sensors are located in the front doors and C-pillars; one sensor in each door and in each C-pillar. The location and orientation are critical for the correct operation of all the impact sensors. Do not use the attachment bolts of the impact sensors to mount any equipment.

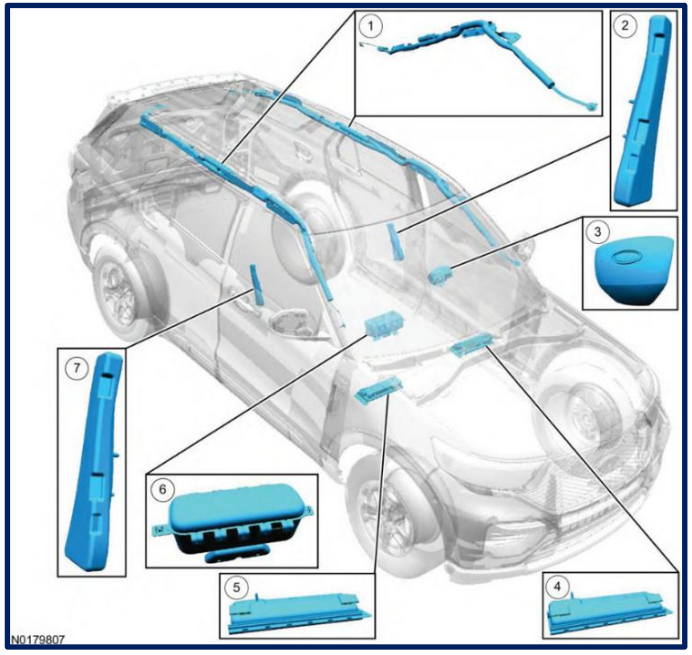
AIRBAG, SAFETY RESTRAINT SYSTEM AND SIDE IMPACT SENSOR COMPONENT DESCRIPTION AND LOCATION *(Cont'd)*

The RCM is mounted under the front of the center console. The RCM orientation is critical for proper operation of the restraint systems. Do not relocate or use the RCM mounting bolts for attachment purposes of any equipment.

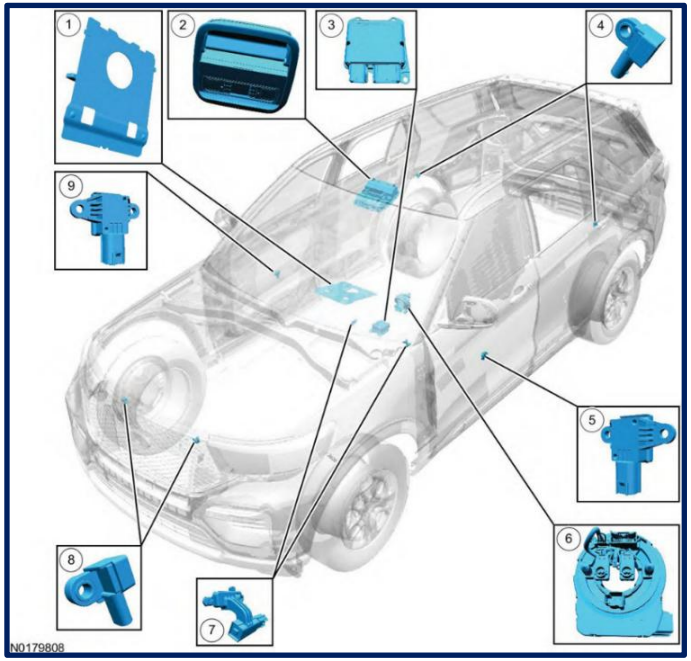
Various safety restraints exist within the vehicle, the restraint system includes various modules, sensors, retractors, airbags and the safety belt systems. Refer to the workshop manual for more detail on the safety restraint system.

NOTE: If OEM rear seat belt, buckles and pre-tensioner cannot be used as design intent, retaining, and securing them will prevent OEM warning notifications to occupants, but the vehicle modifier is responsible for providing an alternative safety restraints system that meets FMVSS requirements.

NOTE: Airbag, safety restraint system and side impact sensor component location shown below.

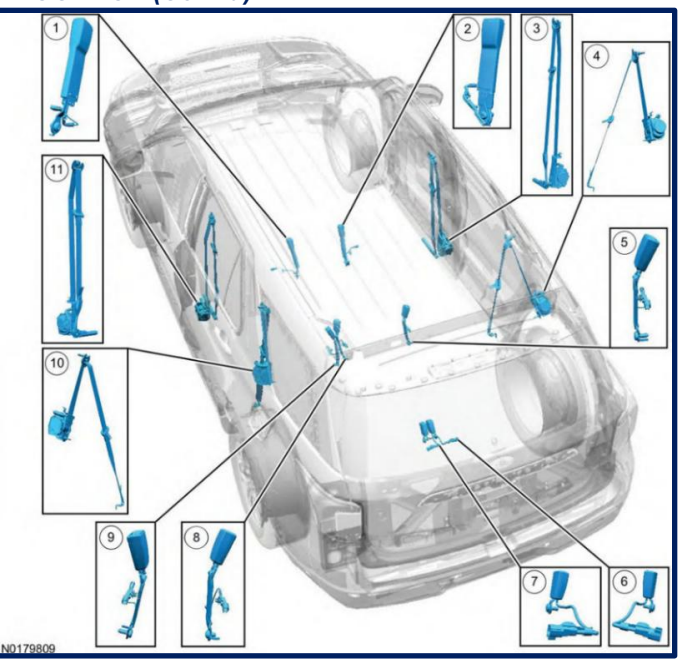


ITEM	DESCRIPTION
1	DRIVER AND PASSENGER SIDE CURTAIN AIRBAG
2	DRIVER SIDE AIRBAG
3	DRIVER AIRBAG
4	DRIVER KNEE AIRBAG
5	PASSENGER KNEE AIRBAG
6	PASSENGER AIRBAG (INCLUDES CANISTER VENT)
7	PASSENGER SIDE AIRBAG



ITEM	DESCRIPTION
1	OCSM (OCCUPANT CLASSIFICATION SYSTEM MODULE) (INCLUDES OCS (OCCUPANT CLASSIFICATION SYSTEM) SENSOR AND GEL-FILLED BLADDER)
2	OVERHEAD CONSOLE (INCLUDES PAD (PASSENGER AIRBAG DEACTIVATION) INDICATOR)
3	RCM (RESTRAINTS CONTROL MODULE)
4	DRIVER AND PASSENGER C-PILLAR SIDE IMPACT SENSORS
5	DRIVER FRONT DOOR SIDE IMPACT SENSOR
6	CLOCKSPRING
7	SEAT POSITION SENSORS
8	DRIVER AND PASSENGER FRONT IMPACT SEVERITY SENSORS
9	PASSENGER FRONT DOOR SIDE IMPACT SENSOR

AIRBAG, SAFETY RESTRAINT SYSTEM AND SIDE IMPACT SENSOR COMPONENT DESCRIPTION AND LOCATION *(Cont'd)*



ITEM	DESCRIPTION
1	DRIVER SEATBELT BUCKLE (INCLUDES BUCKLE SENSOR)
2	FRONT PASSENGER SEATBELT BUCKLE (INCLUDES BUCKLE SENSOR AND BELT TENSION SENSOR (BTS)
3	FRONT PASSENGER SEATBELT RETRACTOR (INCLUDES RETRACTOR PRETENSIONER, RETRACTOR LOAD LIMITER AND ANCHOR PRETENSIONER)
4	SECOND ROW PASSENGER SIDE OUTER SEATBELT RETRACTOR (INCLUDES RETRACTOR PRETENSIONER)
5	SECOND ROW PASSENGER SIDE OUTER SEATBELT BUCKLE (INCLUDES SEATBELT BUCKLE SWITCH)
6	THIRD ROW PASSENGER SIDE SEATBELT BUCKLE (INCLUDES SEATBELT BUCKLE SWITCH)
7	THIRD ROW DRIVER SIDE SEATBELT BUCKLE (INCLUDES SEATBELT BUCKLE SWITCH)
8	SECOND ROW CENTER SEATBELT BUCKLE (IF EQUIPPED) (INCLUDES SEATBELT BUCKLE SWITCH)
9	SECOND ROW DRIVER SIDE OUTER SEATBELT BUCKLE (INCLUDES SEATBELT BUCKLE SWITCH)
10	SECOND ROW DRIVER SIDE OUTER SEATBELT RETRACTOR (INCLUDES RETRACTOR PRETENSIONER)
11	DRIVER SEATBELT RETRACTOR (INCLUDES RETRACTOR PRETENSIONER)

AIRBAG DEPLOYMENT INTERFERENCE

WARNING: Do not place objects or mount equipment in front of the airbag module cover or in the front seat area; this is to avoid contact with a deploying airbag. Placing objects on or over the airbag inflation area may cause those objects to be propelled by the airbag. Failure to follow these instructions may result in personal injury.
WARNING: Dash, tunnel or console-mounted equipment should be placed only within their specified zone. Failure to follow this instruction may result in personal injury.
WARNING: Do not mount equipment between the side of the front seat and the door trim that would block deployment of the side airbag. Failure to follow this instruction may result in personal injury.
WARNING: Do not mount equipment on the instrument panel between the driver and the pedal area, between the door and the console that may come in contact with or block a deploying knee airbag. Failure to follow this instruction may result in personal injury.
WARNING: Do not attempt to service, repair or modify the airbag supplemental restraint systems (SRS) or its fuses. See your Ford or Lincoln dealer. Failure to follow this instruction may result in personal injury.
WARNING: Modifications to the front end of the vehicle, including frame, bumper, front end body structure, tow hooks and B-pillar surrounding parts may affect the performance of the airbag sensors, increasing the risk of injury. Do not modify the front end of the vehicle.
WARNING: Do not place objects or mount equipment on or near the headliner at the siderail that may come into contact with a deploying Safety Canopy® System. Failure to follow this instruction may increase the risk of personal injury in the event of a collision.
WARNING: Do not attempt to service, repair or modify the Safety Canopy® System, its fuses, the A, B, C, or D-pillar trim, or the headliner on a vehicle containing a Safety Canopy® System. See your Ford or Lincoln dealer.
WARNING: To reduce risk of injury, do not obstruct or place objects in the deployment path of the inflatable Safety Canopy® System.

NOTICE: The side impact sensors are tuned to excite based on their mass (including wiring), as well as the host sheet metal. Any alteration to these components must be avoided. Additions, such as padding, wire connectors, retainers, tape or fasteners of any kind should not be used. All fasteners in this predominantly sheet metal environment should be made of steel or a non-conductive plastic to guarantee retention and longevity. If any part of a steel fastener is exposed to a wet area, it should be plated to resist corrosion.

Driver/passenger airbags affect the way equipment can be mounted in vehicles. Any surfaces that could come into contact with an airbag during deployment must not damage the airbag or alter its deployment path. Sharp edges, corners or protrusions could damage the nylon airbag material and reduce the effectiveness of the airbag. Do not mount or place any objects in the deployment path of an airbag. Airbags must be allowed to fully deploy without restriction. The deployment of airbags is not compatible with any configuration of equipment mounting that places objects in the airbag deployment path. Equipment mounted or placed in the deployment area of an airbag will reduce the effectiveness of the airbag, damage the airbag and potentially damage or dislodge the equipment.

Airbag deployment drawings are provided in Section 7. Consult the drawings before equipment is installed inside the passenger compartment to make sure that the mounted equipment does not interfere with airbag deployment.

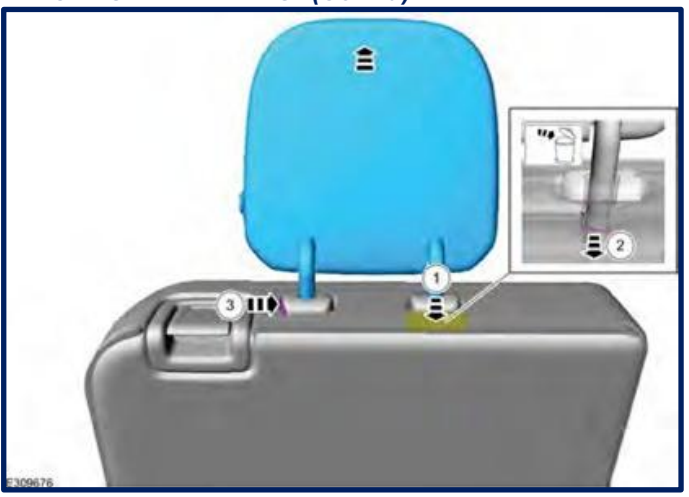
FRONT SEAT HEADREST

1. Remove the outboard seat head restraint.
   a. Push down on the outboard seat backrest cover to gain access to the outboard seat head restraint retaining clip.
   b. Remove and discard the outboard seat head restraint retaining clip.
   c. Push the outboard seat headrest restraint release button.

POLICE MODIFIER GUIDE

SECTION 3 - INSTALLATION CONSIDERATIONS

FRONT SEAT HEADREST *(Cont'd)*

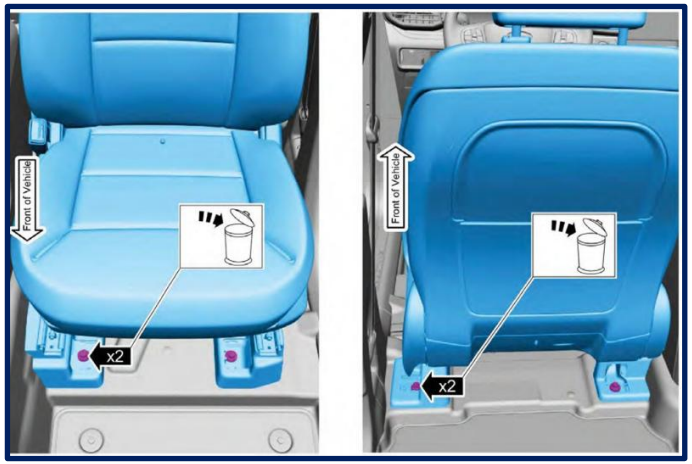


SEAT ATTACHING BOLTS

The vehicle safety belts and seat assemblies are factory installed in their correct location. Seat attaching bolts are not to be used as attachment points for any equipment. Front seat bolts are to be discarded when removed (one time use). Any added material between the seat attaching bolt and the seat frame could have unpredictable effects on the seat bolt torque. If the safety belts are removed for any reason, all of the appropriate attaching hardware must be hand started and then tightened to the correct torque specifications as per the Workshop Manual. Proper operation must be verified before returning the vehicle to service.

NOTE: The retainers shown below are one time use. If removed, replace with a new retainer.

Front Seats

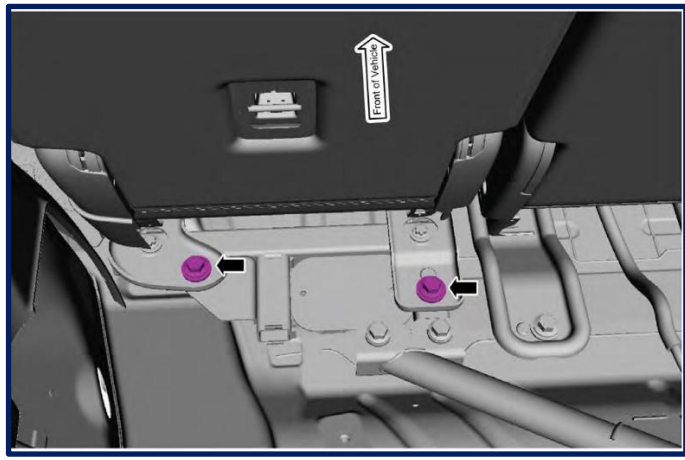


NOTE: If removed torque the bolts in the following sequence.

1. 35 lb. ft (47 Nm)
2. 35 lb. Ft (47 Nm)
3. 35 lb. ft (47 Nm)
4. 35 lb. Ft (47 Nm)

Rear Outboard Seat

If removed, torque to 33lb.ft (45 Nm)

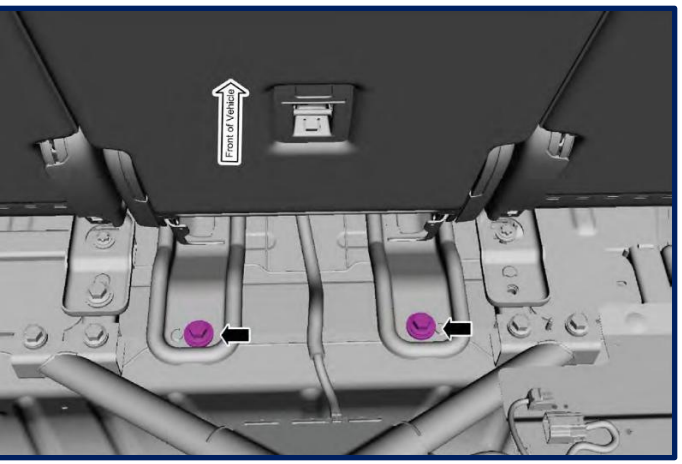


If removed, torque to 33 lb. ft (45 Nm)

Rear Center Seat

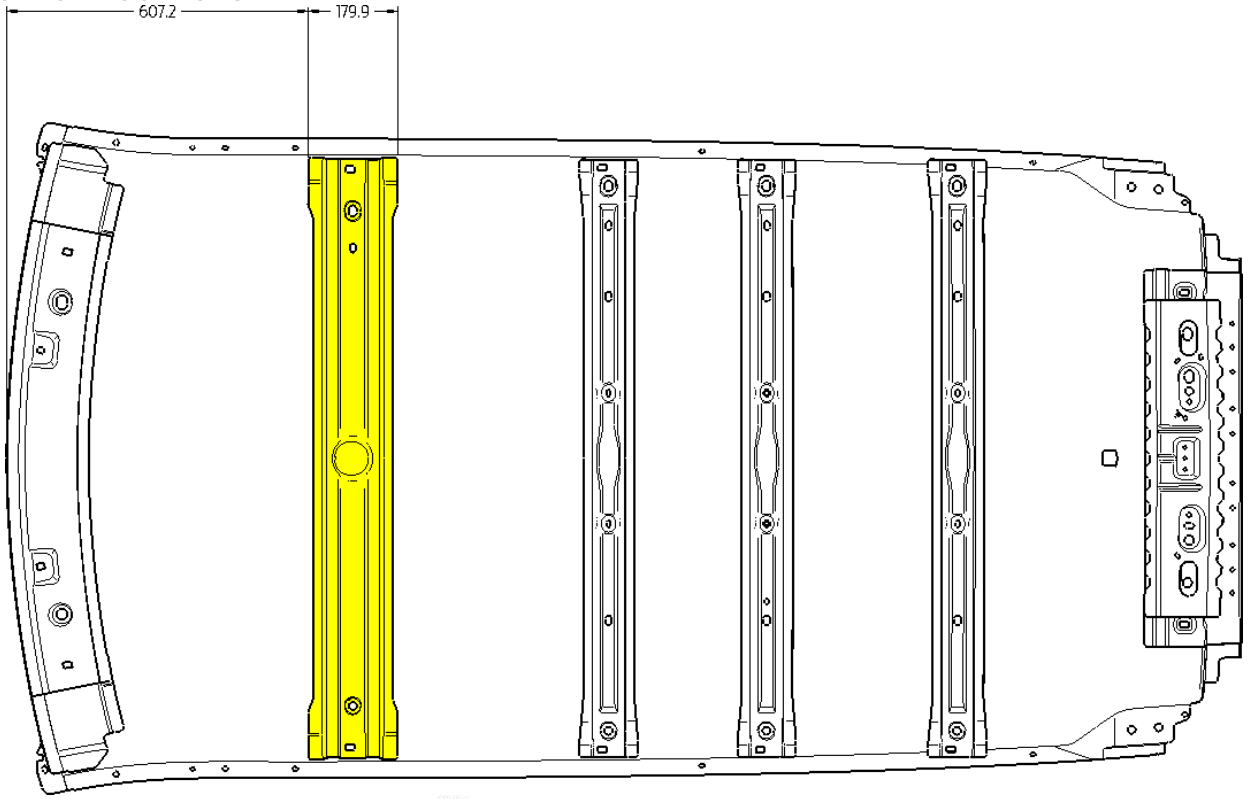
If removed, torque to 33lb.ft (45 Nm)

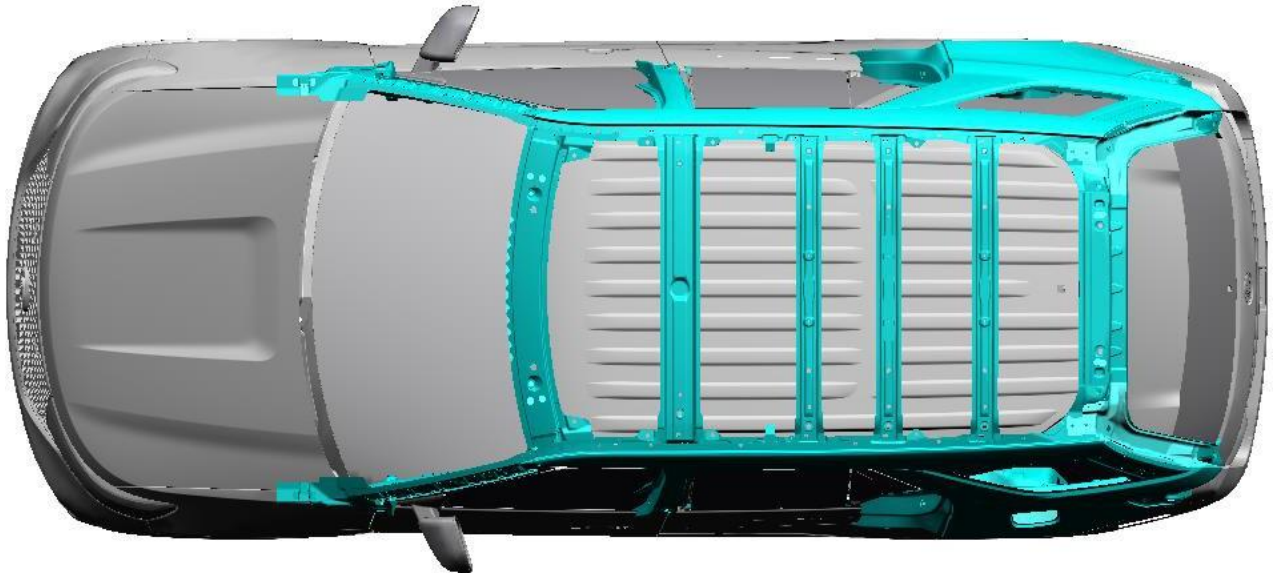
Rear Center Seat *(Cont'd)*



If removed, torque to 33lb.ft (45 Nm)

ROOF BOW LOCATIONS





POLICE MODIFIER GUIDE

SECTION 3 - INSTALLATION CONSIDERATIONS

AREAS TO AVOID - MOUNTING LOCATIONS

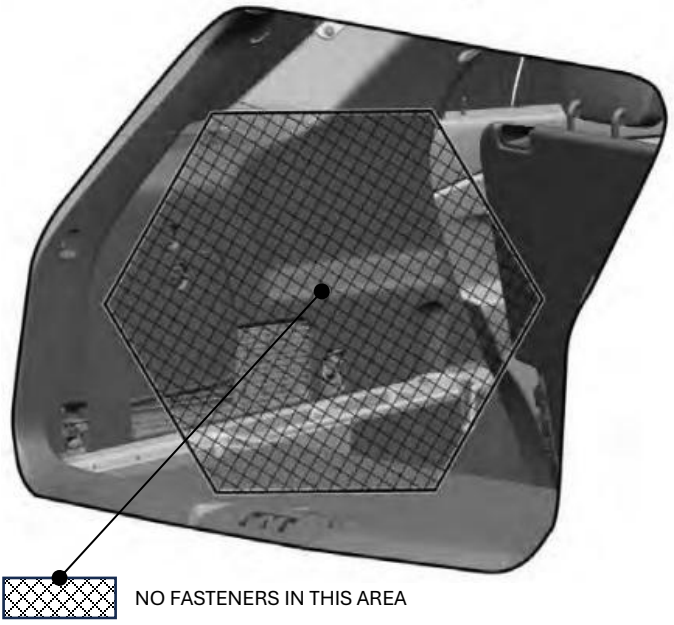
The following illustrations show locations to avoid when choosing components mounting locations, these locations include High Voltage Components and Cables, Fuel System Components, Brake System Components, and Exhaust Components.

To avoid personal injury or damage to vehicle systems avoid drilling or mounting of components in these areas.

Cargo Area

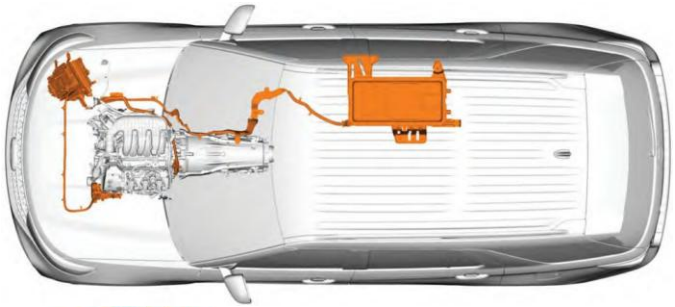
Driver side of cargo area shown no fasteners should be attached to passenger side of cargo area also.

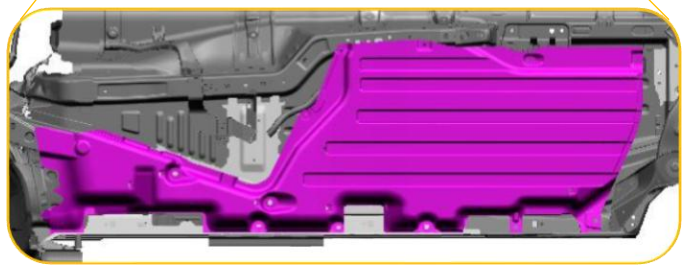
View looking forward into rear of Interceptor utility sides highlighted area upfitters are to avoid using fasteners.



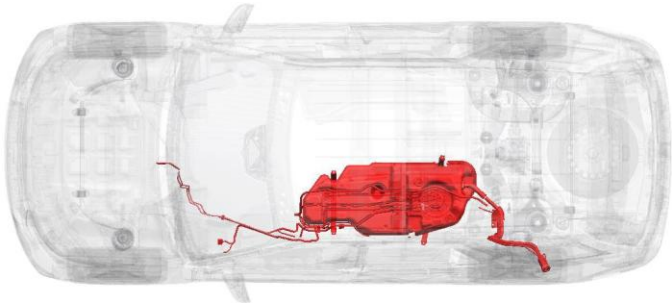
NO FASTENERS IN THIS AREA

High Voltage System Components

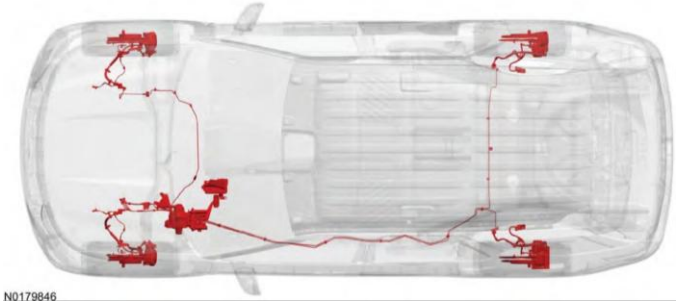




Fuel System Components

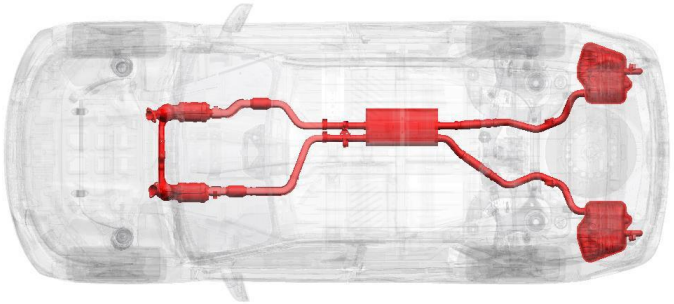


Brake System Components



N0179846

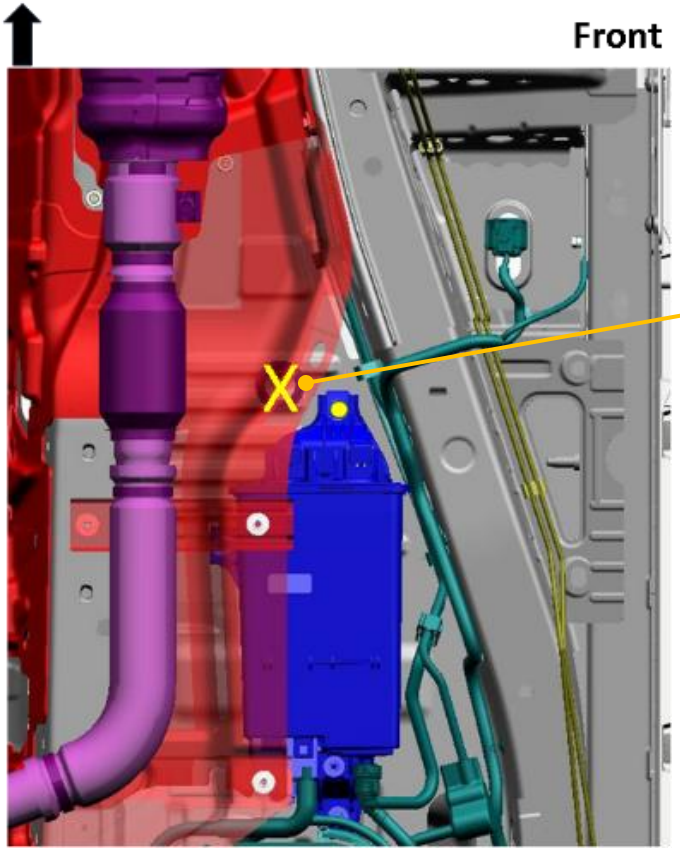
Exhaust System Components

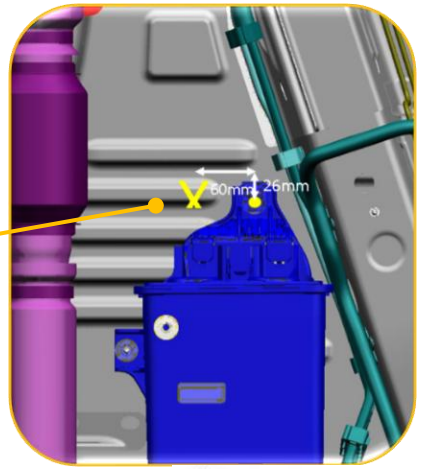


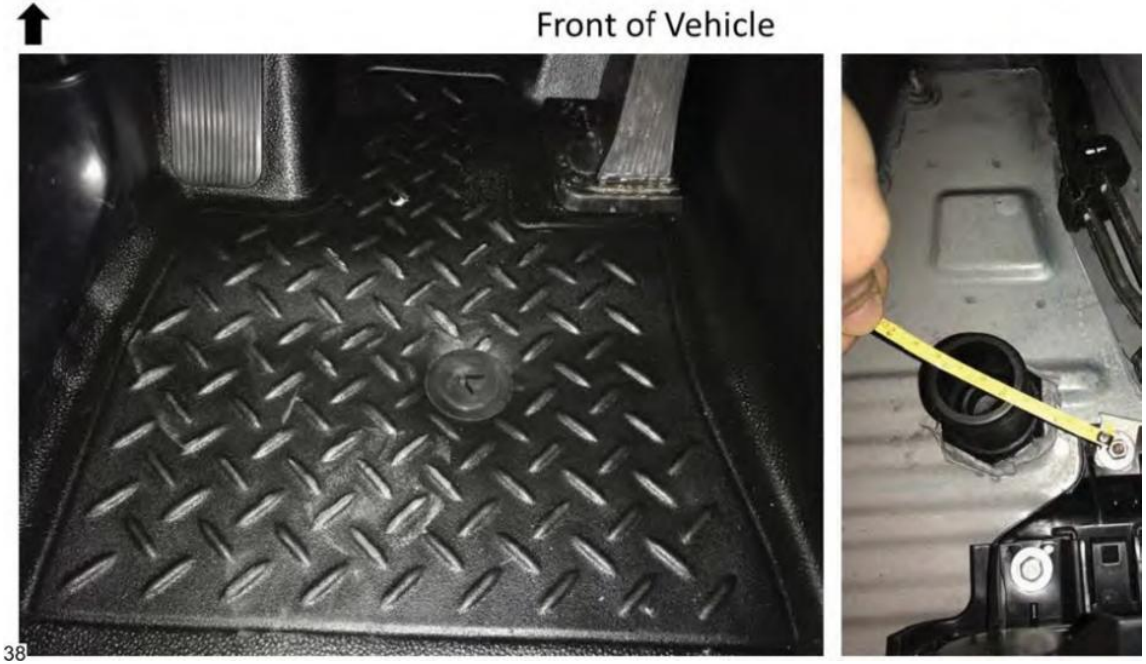
FLOOR DRAIN

2nd row passenger side V-Drains are not feasible on the Police Interceptor Utility Hybrid due to the FHEV battery location.

Driver's Footwell
Measure 60 mm (2.4 inches) inboard and 26 mm (1 inch) forward of the front mounting stud of evaporator canister. Center the hole on flat between floor pan ribs, as seen in the images below. All holes should be drilled from the underside of the vehicle, starting with a small pilot hole, and then moving to the appropriately sized hole saw.



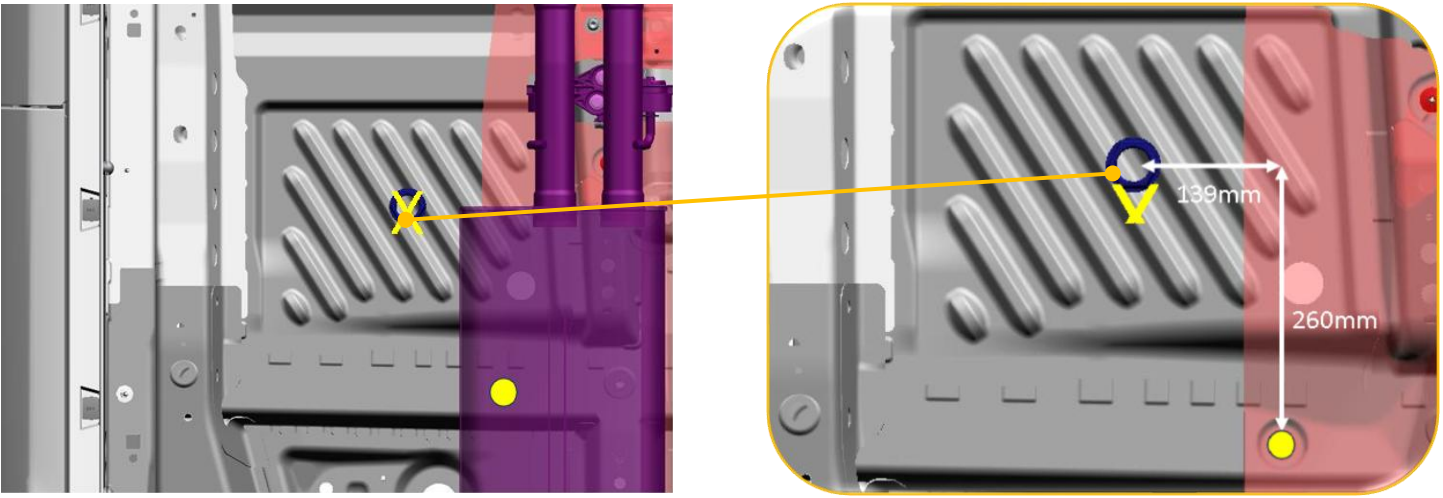


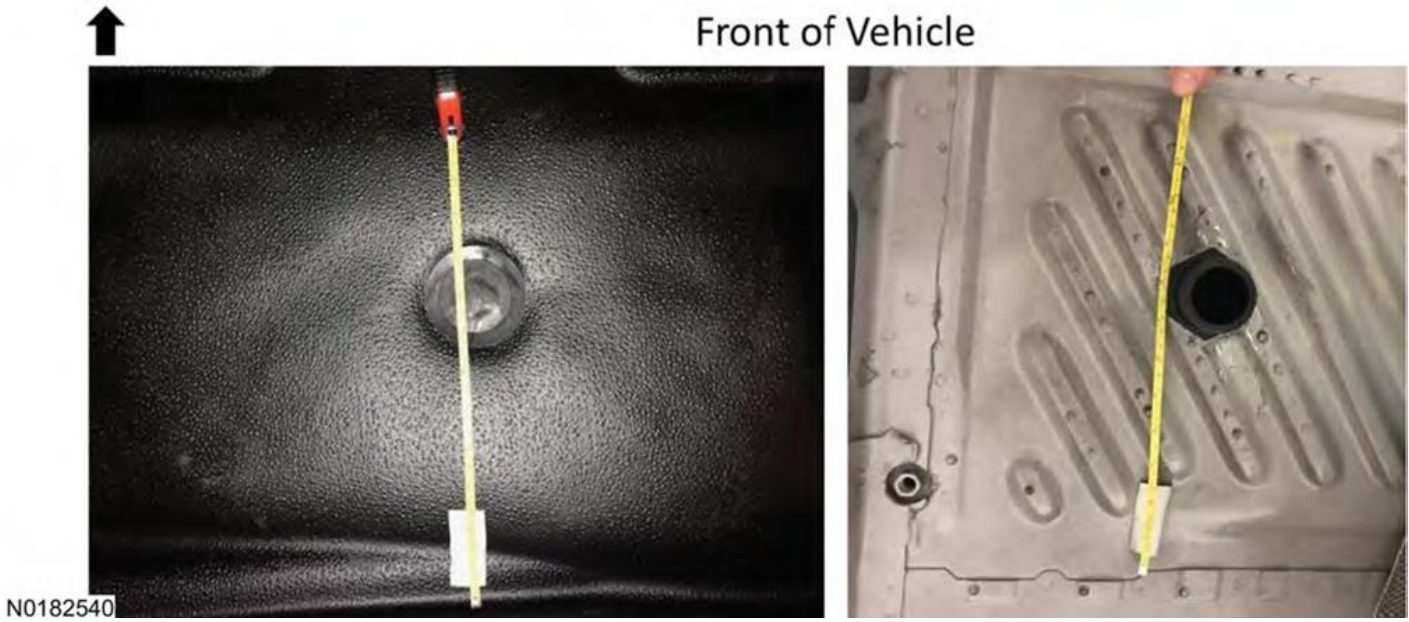


FLOOR DRAIN *(Cont'd)*

2nd Row RHS Footwell (3.3L and 3.0L Gas Models ONLY)
Measure 139 mm (5.5 inches) outboard and 260 mm (10.2 inches) forward of the identified heat shield stud. Center the hole on flat between floor pan ribs, as seen in the images below. All holes should be drilled from the underside of the vehicle, starting with a small pilot hole, and then moving to the appropriately sized hole saw.

NOTE: 2nd row passenger side footwell drain not feasible on hybrid models due to FHEV battery location





SECTION 4 - AIRBAG DEPLOYMENT INTERFERENCE ZONES

AIRBAG DEPLOYMENT INTERFERENCE ZONES

WARNING: Do not place objects or mount equipment in front of the airbag module cover or in the front seat area; this is to avoid contact with a deploying airbag. Placing objects on or over the airbag inflation area may cause those objects to be propelled by the airbag. Failure to follow these instructions may result in severe personal injury or death.
WARNING: Dash, tunnel or console-mounted equipment should be placed only within their specified zone. Failure to follow this instruction may result in severe personal injury or death.
WARNING: Do not mount equipment between the side of the front seat and the door trim that would block deployment of the side airbag. Failure to follow this instruction may result in personal injury.
WARNING: Do not attempt to service, repair or modify the airbag supplemental restraint systems (SRS) in any way. Failure to follow this instruction may result in severe personal injury. See your Ford or Lincoln dealer.
WARNING: Modifications to the front end of the vehicle, including frame, bumper, front end body structure, tow hooks and B-pillar surrounding parts may affect the performance of the airbag sensors, increasing the risk of injury. Do not modify the front end of the vehicle. Failure to follow these instructions may result in severe personal injury or death.
WARNING: Do not place objects or mount equipment on or near the headliner at the siderail that may come into contact with a deploying safety canopy. Failure to follow this instruction may increase the risk of personal injury in the event of a collision.
WARNING: Do not attempt to service, repair or modify the Safety Canopy® System, its fuses, the A, B, C, or D-pillar trim, or the headliner on a vehicle containing a Safety Canopy® System. See your Ford or Lincoln dealer. Failure to follow these instructions may result in personal injury.

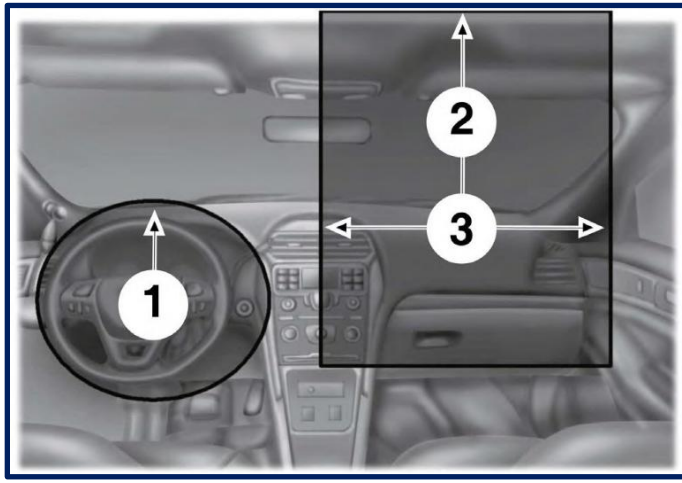
NOTICE: The side impact sensors are tuned to excite based on their mass (including wiring), as well as the host sheet metal. Any alteration to these components must be avoided. Additions, such as padding, wire connectors, retainers, tape or fasteners of any kind should not be used. All fasteners in this predominantly sheet metal environment should be made of steel or a non-conductive plastic to guarantee retention and longevity. If any part of a steel fastener is exposed to a wet area, it should be plated to resist corrosion.

Driver/passenger airbags affect the way equipment can be mounted in vehicles. Any surface that could come into contact with an airbag during deployment must not damage the airbag or alter its deployment path. Sharp edges, corners or protrusions could damage the nylon airbag material and reduce the effectiveness of the airbag. Do not mount or place any objects in the deployment path of an airbag. Airbags must be allowed to fully deploy without restriction. The deployment of airbags is not compatible with any configuration of equipment mounting that places objects in the airbag deployment path. Equipment mounted or placed in the deployment area of an airbag will reduce the effectiveness of the airbag, damage the airbag and potentially damage or dislodge the equipment.

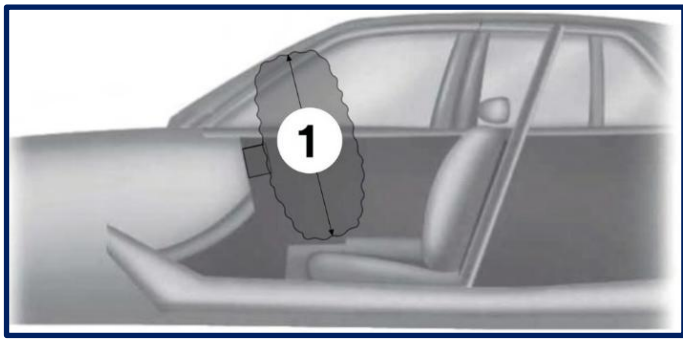
Some approximate dimensions for airbags, at full inflation, are provided. These dimensions are somewhat flexible and represent free-form deployments without the loading of occupants. The zone dimensions provided are approximate and will vary with the loading of occupants in the seats.

All airbag and equipment mounting zone dimensions are approximate due to different airbag deployment characteristics.
Do not mount equipment between the side of the front seat and the door trim that would block deployment of the side airbag.

NOTE: Do not mount equipment on the instrument panel between the driver and passenger airbags due to deployment variability.



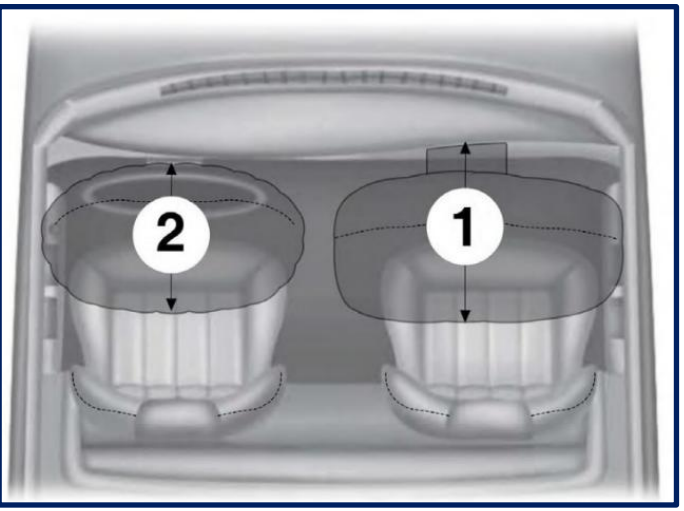
1. 240 mm (9.5 in) from center of emblem.
2. 350 mm (13.8 in) from center of airbag door
3. 720 mm (28.3 in)



1. 700 mm (27.5 in)

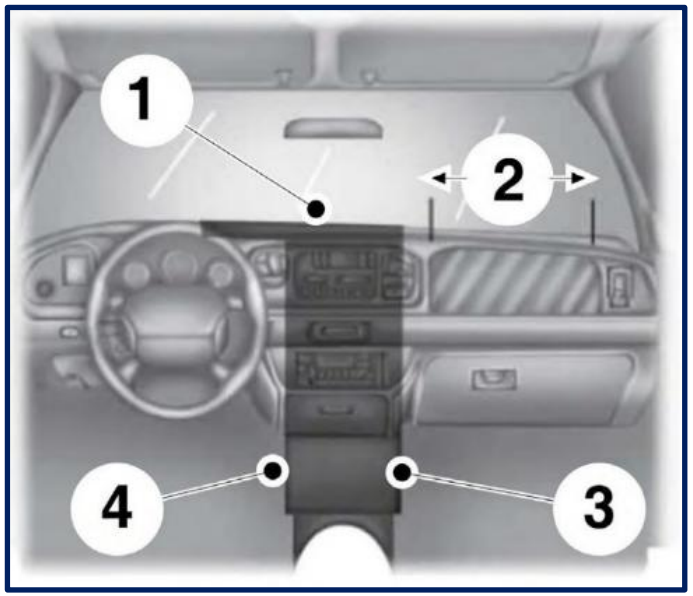
SECTION 4 - AIRBAG DEPLOYMENT INTERFERENCE ZONES

AIRBAG DEPLOYMENT INTERFERENCE ZONES *(Cont'd)*

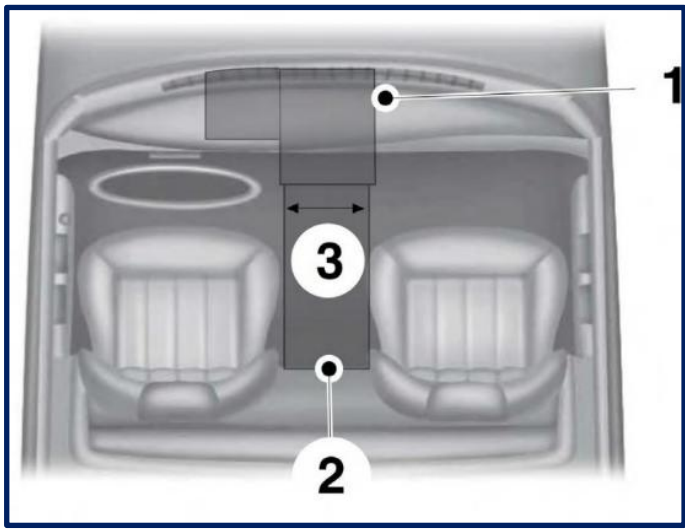


1. 580 mm (22.8 in) Front passenger airbag.
2. 430 mm (17 in) Front driver airbag.

3. 700 mm (27.5 in) Up from side airbag module



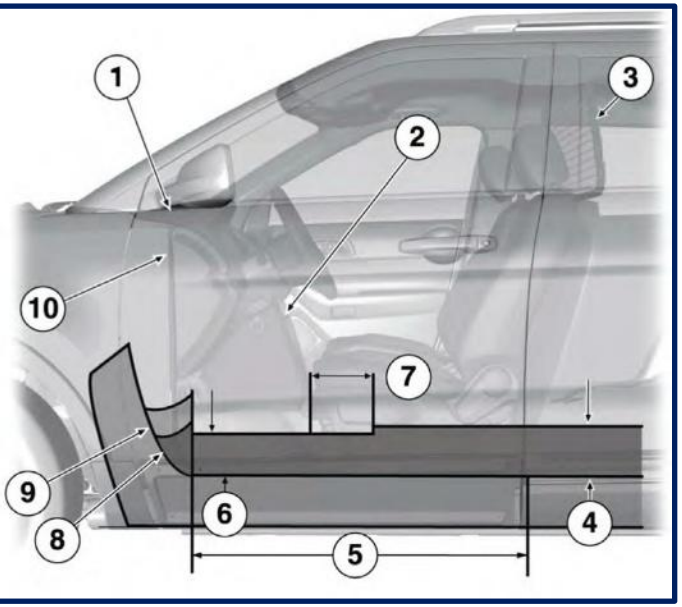
1. Area on top of the instrument panel.
   NOTE: Equipment must not interfere with driver visibility.
2. Airbag door must be kept clear for deployment of the airbag.
3. Area in front of the center console from the bottom to the top of the instrument panel.
4. Area in front of electronic finish panel from the bottom to the top of the instrument panel.



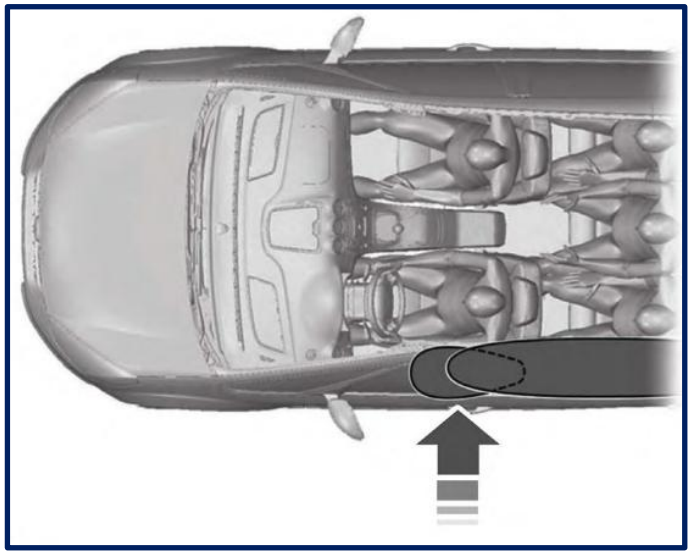
1. Area on top of the instrument panel.
   NOTE: Equipment must not interfere with driver visibility.
2. Area on tunnel between seats.
3. 229 mm (9 in)

SECTION 4 - AIRBAG DEPLOYMENT INTERFERENCE ZONES

AIRBAG DEPLOYMENT INTERFERENCE ZONES *(Cont'd)*

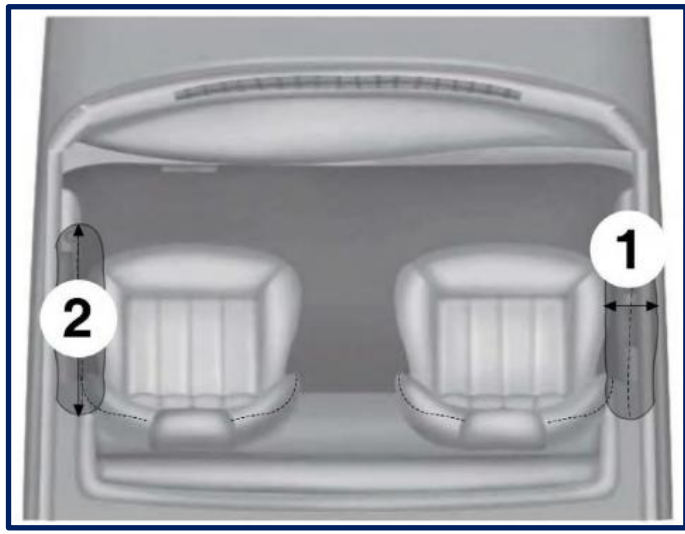


1. Area on top of instrument panel.
2. Area in front of center console from tunnel up to instrument panel.
3. Prisoner screen (reference only).
4. 254 mm (10 in)
5. Area on tunnel between seats.
6. Height: 216 mm (8.5 in)
7. 305 mm (12 in).
8. Area on tunnel beneath center console.
9. Tunnel.
10. 38 mm (1.5 in).



The side airbags are located on the outboard side of the seatbacks of the front seats. In certain sideways crashes, the airbag on the side affected by the crash will be inflated. The airbag was designed to inflate between the door panel and occupant to further enhance the protection provided occupants in side impact crashes.

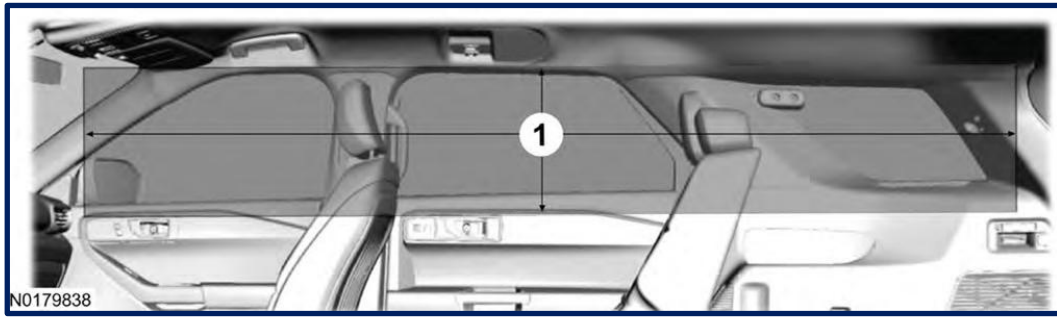
The Safety Canopy will deploy during significant side crashes or when a certain likelihood of a rollover event is detected by the rollover sensor. The Safety Canopy is mounted to the roof side-rail sheet metal, behind the headliner, above each row of seats. The Safety Canopy curtain airbags above the trim panels over the front and rear side windows identified by a label or wording on the headliner or roof pillar trim. In certain sideways crashes or rollover events, the Safety Canopy will be activated, regardless of which seats are occupied. The Safety Canopy is designed to inflate between the side window area and occupants to further enhance protection provided in side impact crashes and rollover events.



1. 200 mm (8 in) From outboard side of seat.
2. 380 mm (15 in) Forward of seatback.

AIRBAG DEPLOYMENT INTERFERENCE ZONES *(Cont'd)*

1. 75mm (6 in) from pillar trim (A through D)



1. Roof rail to 25mm (1 in) below windowsill.

NOTICE: Any surfaces that could come into contact with side air curtain (Safety Canopy® System) during deployment must not damage the curtain. Sharp edges, corners or protrusions could damage the curtain and reduce the overall effectiveness of the side air curtain.

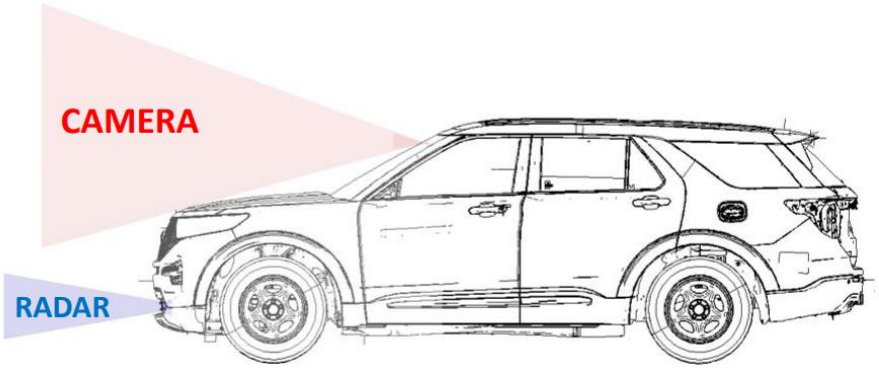
NOTICE: The side impact sensors are tuned to excite based on their mass (including wiring), as well as the host sheet metal. Any alteration to these components must be avoided. Additions, such as padding, wire connectors, retainers, tape or fasteners of any kind should not be used. All fasteners in this predominantly sheet metal environment should be made of steel or a non-conductive plastic to guarantee retention and longevity. If any part of a steel fastener is exposed to a wet area, it should be plated to resist corrosion.

- Do not mount equipment to the A, B, C and D-pillars.
- Do not mount equipment on the headliner within 200 mm (8 in) of the side edges.
- Do not mount equipment above the beltline within 200 mm (8 in) of the side glass from the A-pillar leading edge to the rear edge of the D- pillar.
- Do not mount equipment on the headliner along the siderails.

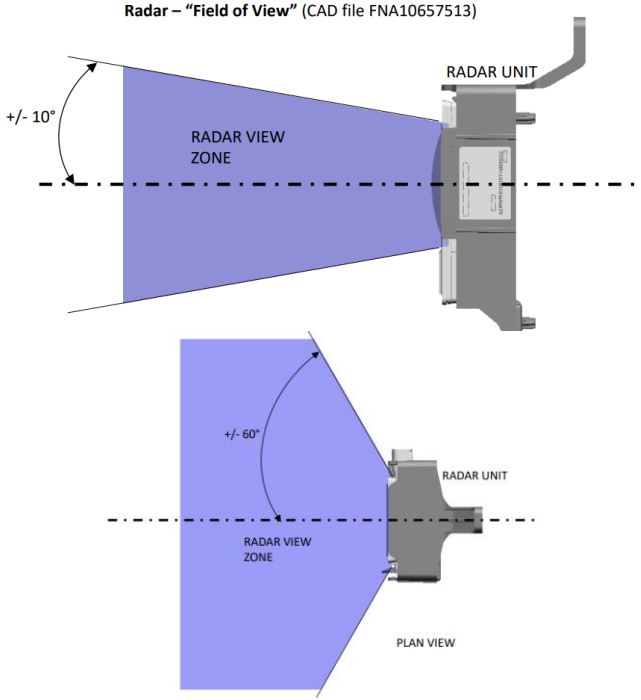
CAMERA AND RADAR 'FIELD OF VIEW'

Detailed dimensional info for locations, to avoid the Radar Signal. And Top Bar info – to avoid the Front Facing Camera, in the windshield.

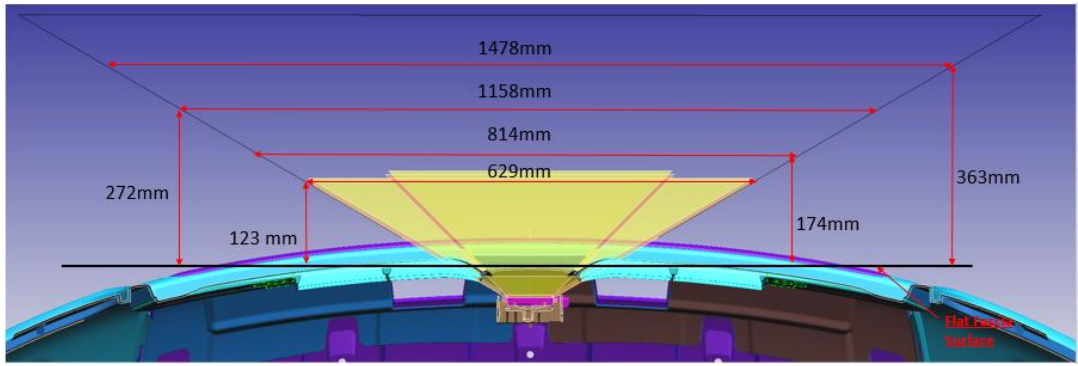
Note: CAD file can be provided upon request from the Ford Pro Body Builder Advisory Service, https://www.fordpro.com/en-us/upfit/bbas/
(Reference CAD File: FNA10657553)



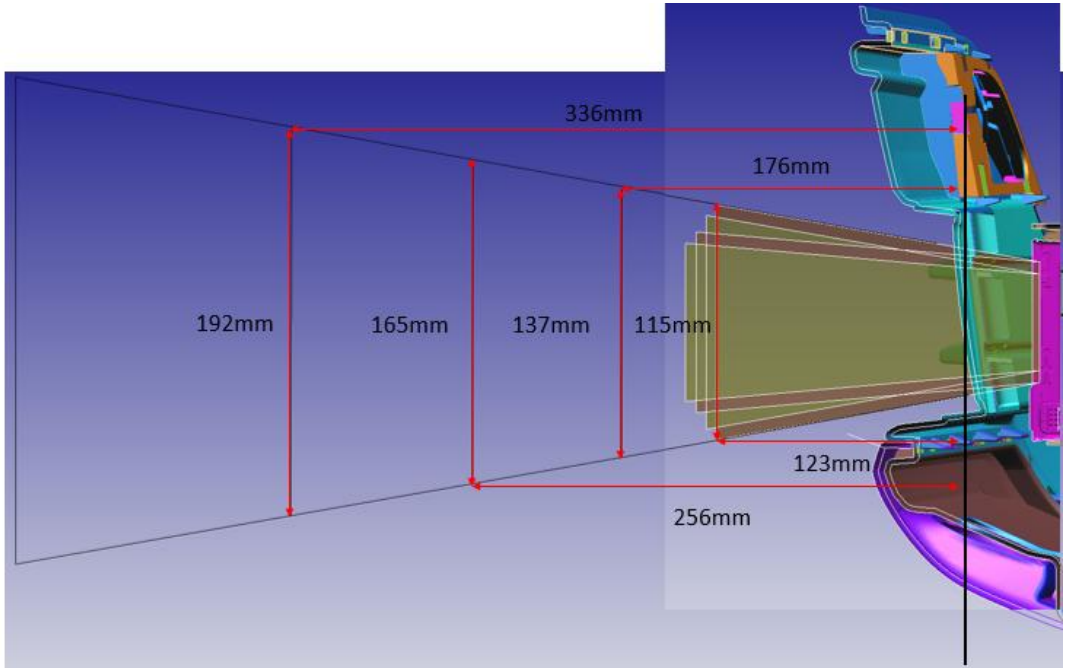
Radar – "Field of View" (CAD file FNA10657513)



Additional Information:
Top View of the Adaptive Cruise Control radar 'Field of View'



Side View of the Adaptive Cruise Control radar 'Field of View'



BALLISTIC PANEL REPLACEMENT:

Tools Required:

A. 7 MM SOCKET
B. 10 MM SOCKET
C. HEX TO 1/4“ APEX
D. ELECTRIC DRILL
E. 90 DEGREE PICK
F. TRIM STICK
G. TRIM PIN REMOVAL TOOL
H. T20 TORX DRIVER
I. 1/2" NUT DRIVER OR 13MM SOCKET
J. J 5MM NUT DRIVER
K. K T27 TORX DRIVER
L. L T25 TORX DRIVER
M. M T30 SOCKET 1/4" DRIVE

LEGEND:

INSPECT

ITEM

TORQUE

CRITICAL PROCESS

OPERATION

TOOLS

BALLISTIC PANEL REPLACEMENT:

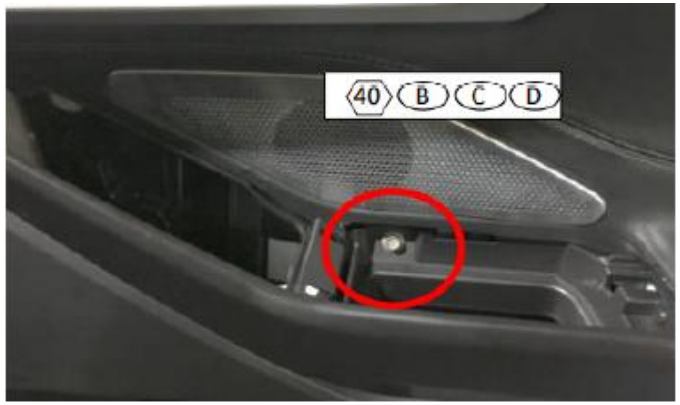
DOOR DISASSEMBLY

(10) Remove door handle closeout panel. Insert a 90-Degree pick through the access hole and pry the cover off and set aside.

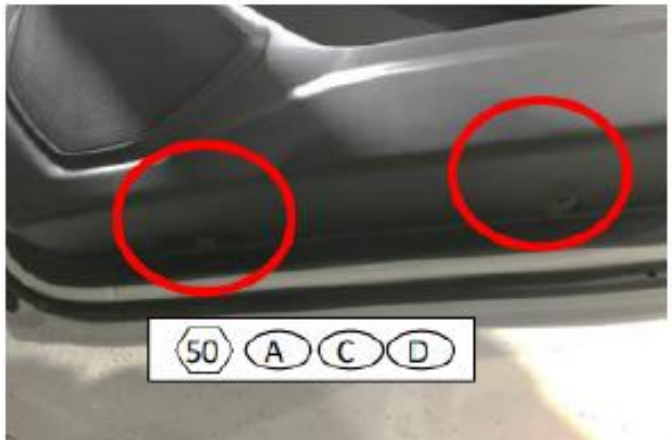
(20) Remove window switch bezel and unplug connector. Use a fiber stick and starting on the side of the bezel pry up and work around the perimeter to release the clips. Unplug the connector and set bezel aside.

(30) Remove OEM bolt behind handle using 7mm socket and set aside.

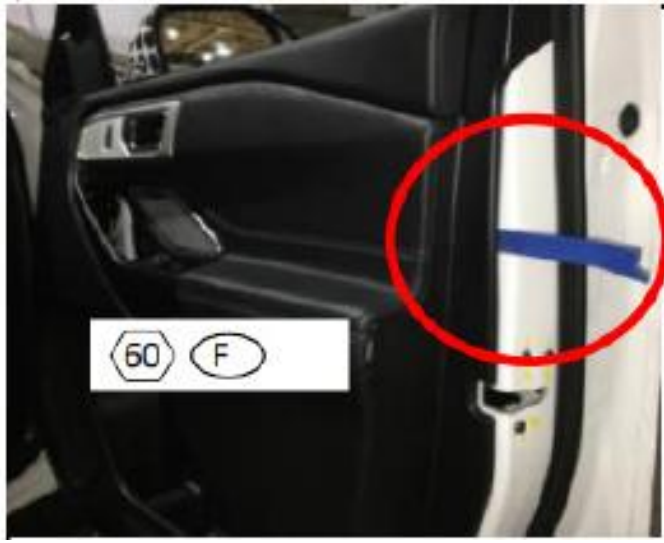
(40) Remove OEM bolt under window switch bezel using 8mm socket and set aside.



(50) Remove two OEMs at bottom of door using 7mm socket and set aside.



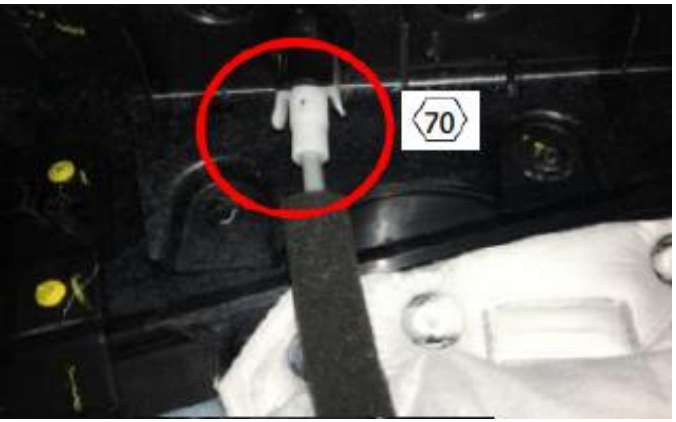
(60) Starting at the rear of the door above the latch, insert a fiber stick and pry away from the door to release the door trim panel clips, work down and around until all clips are released.



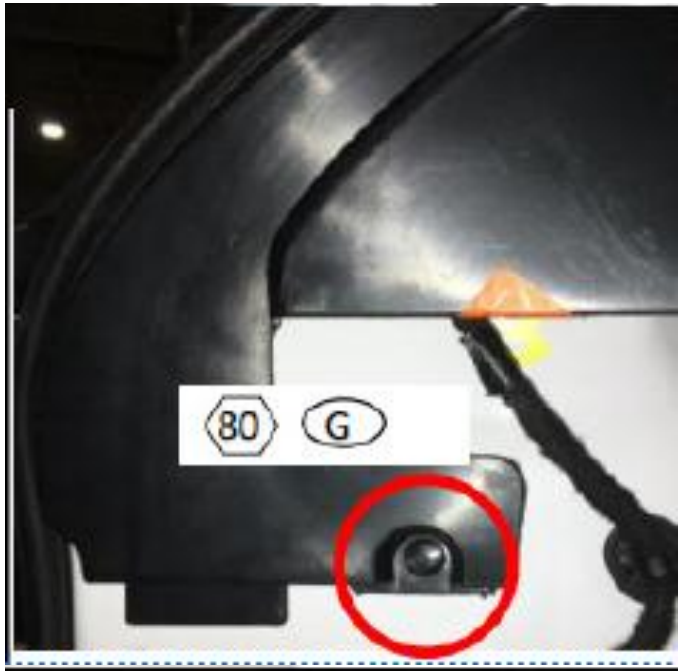
(70) Disconnect handle connector by pulling the tab on the back of the connector to release it from the mechanism. Disconnect the wire harness connector and lock solder from door-side plugs. Set the trim panel.

POLICE MODIFIER GUIDE

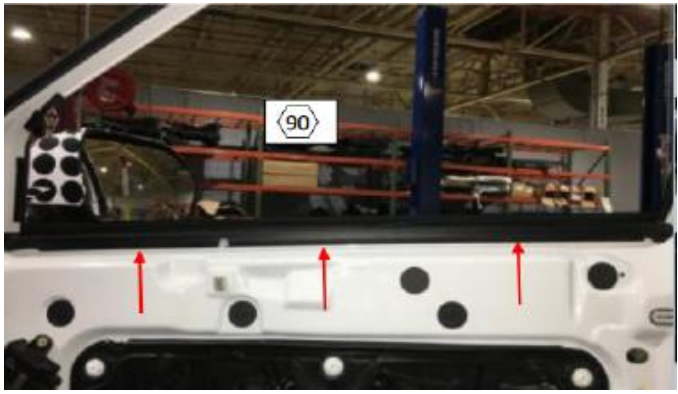
SECTION 5 - REFERENCE INFORMATION



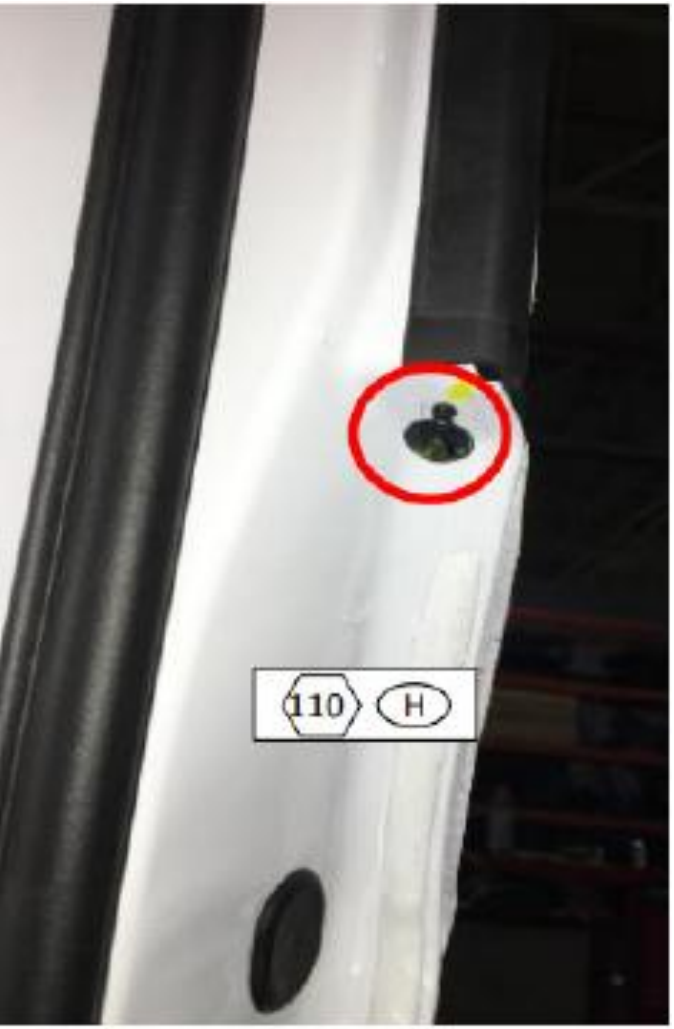
(80) Remove inner window trim by popping out pushpins with pin removal tool and gently pulling off. Set this piece aside.



(90) Remove inner window bezel by pushing up on it and releasing it from the door. Set this piece aside.



(110) Remove outer window bezel by removing OEM T20 head screw and pulling up. Set bolt and window bezel aside.

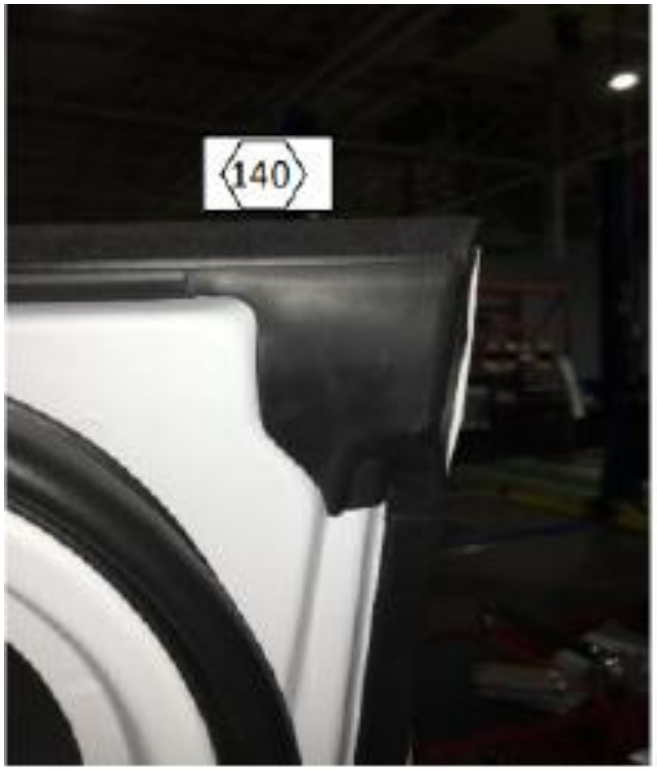


(120) Remove window by plugging in the window switch and raising the window until the clips are in line with the access holes.

(130) Gently push on these clips with T20 driver while pulling upward on the window and pull the window out of the door set window aside in an easily visible location.

(130) Gently push on these clips with T20 driver while pulling upward on the window and pull the window out of the door set window aside in an easily visible location.

(140) Remove OEM T20 head screw holding outer trim cover and set aside.



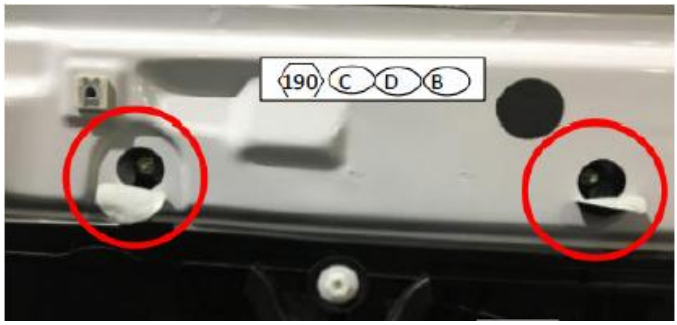
(150) Remove outer trim by first removing the top corner and then gently pulling off. Set this piece aside.

(160) Remove outer trim cover by using pushpin tool to pop out two pins and pulling cover off. Set cover aside. NOTE In this picture the trim cover has camouflage tape on it. This tape is not required.

(170) Remove 4 wire harness clips from the window regulator panel with a 90-Degree pick.

(180) Turning 12 connecting pins 90-Degrees counterclockwise with ½" nut driver or 13mm socket.

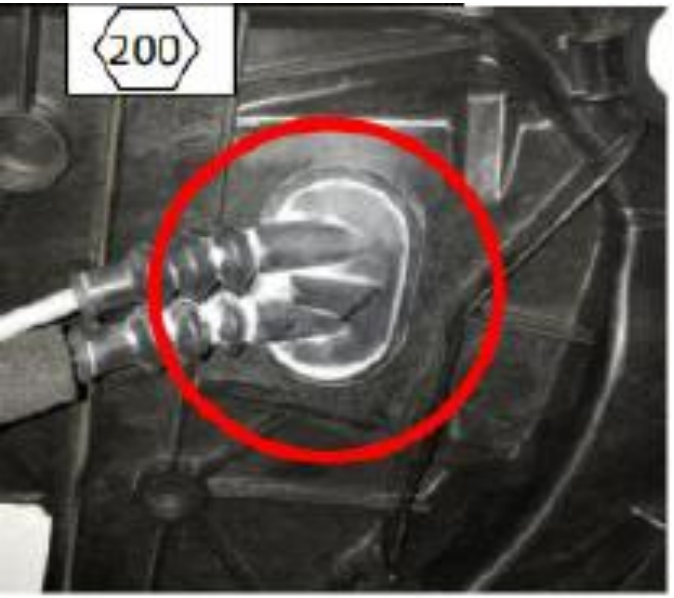
(190) Peel back two stickers to reveal two nuts. Loosen (DO NOT REMOVE) two 10mm head nuts at the top of the panel using a 10mm socket.



POLICE MODIFIER GUIDE

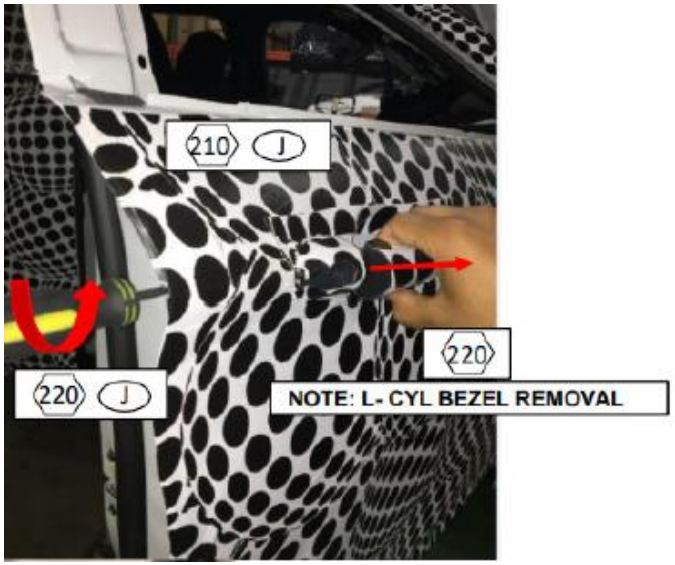
SECTION 5 - REFERENCE INFORMATION

(200) Push the handle/lock soldier grommet through the panel. Pull the panel out and down to remove.

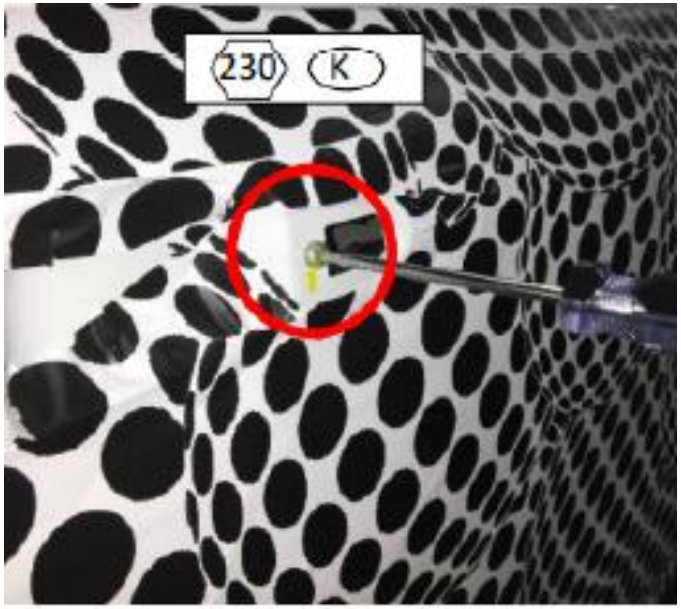


(210) Remove door handle by removing rubber cover and using a 5 mm nut driver, loosen bolt (about 6.5 revolutions) and pull on the handle to release. NOTE: The door in this image shows camouflage tape on it. This tape is not required.

(220) Pull lock cylinder bezel off. NOTE: You may need to loosen the bolt 3 more revolutions to remove the bezel. DO NOT FORCE BEZEL.

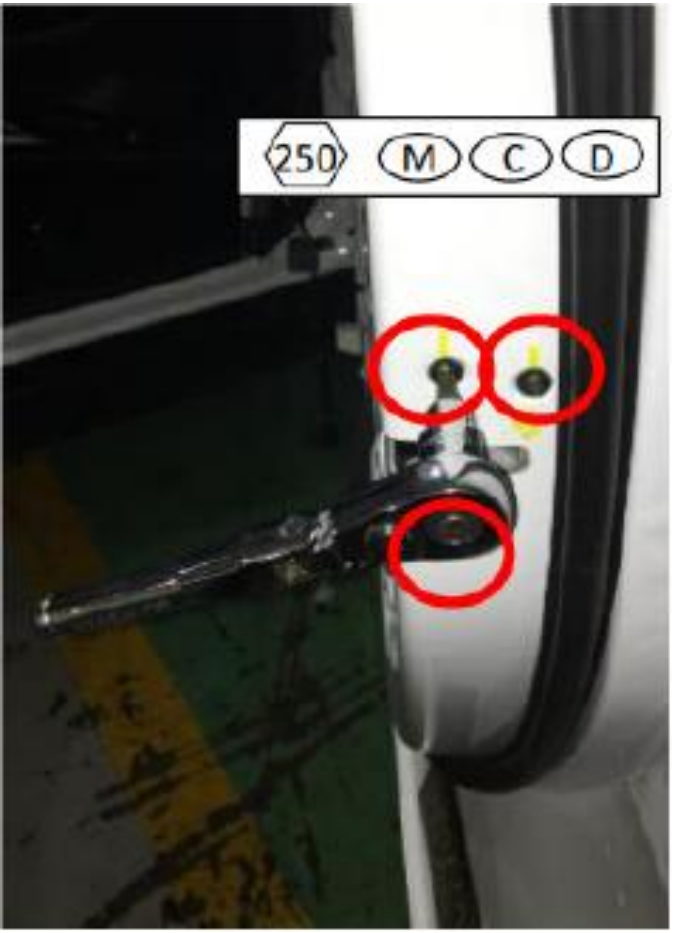


(230) Remove TORX head bolt that attaches under the handle using T27 TORX driver. NOTE: The door in this image shows camouflage tape on it. This tape is not

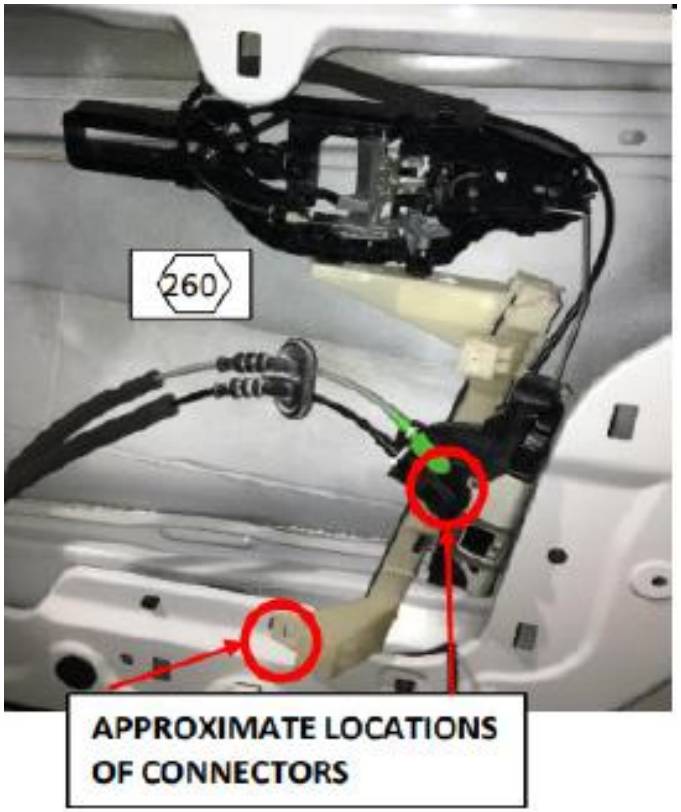


(240) Remove window track TORX head screws with a T25 T

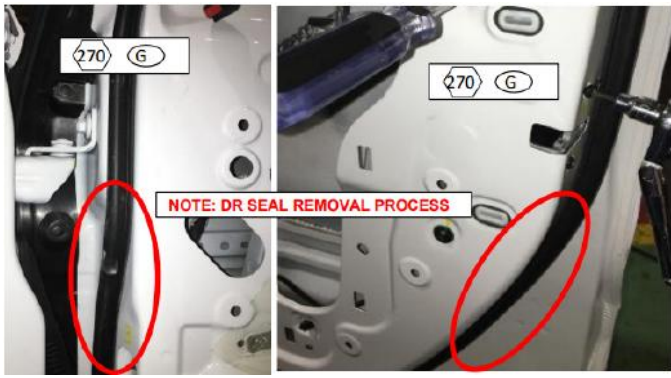
(250) Remove 3 latch screws with T30 socket and discard these will be replaced with new screws.



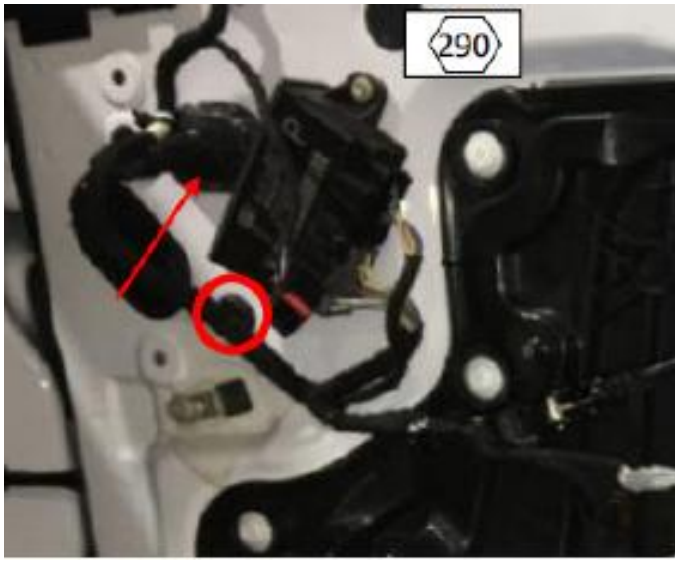
(260) Remove latch from door and unplug wire harness and harness “Christmas Tree Pin” that are connected to the latch assembly.



(270) Using a small blade push pin removal tool. Remove the door seal push pins at the locations shown. NOTE: pulling the seal from the outside may cause damage. Seal push pins are part of the weather seal make sure the push pins are present upon removal. If push pins remain in door the drill fixture will not fit correctly.



(290) Move wire harness by releasing clip inside door. Removing grommet and pushing wire into grommet hole.



PANEL PREPARATION

Tools Required:

A. VISE CLAMPS
B. DRILL
C. LETTER P DRILL BIT
D. ANGLE DRILL
E. MODIFIED 10MM STEP DRILL
F. 3/8“ THREADED SHANK BIT
G. DEBURR TOOL
H. AIR GUN

LEGEND:

INSPECT

ITEM

TORQUE

CRITICAL PROCESS

OPERATION

TOOLS

(10) Install LH Ballistic drill fixture FA-U625-060 onto door and secure with vise clamps as shown.

(20) Drill 9 holes using letter “P” drill bit.

(30) Drill 2 holes at the front of the door using pneumatic angle drill with 3/8” bit.

(40) Remove drill fixture from the door. (not shown)

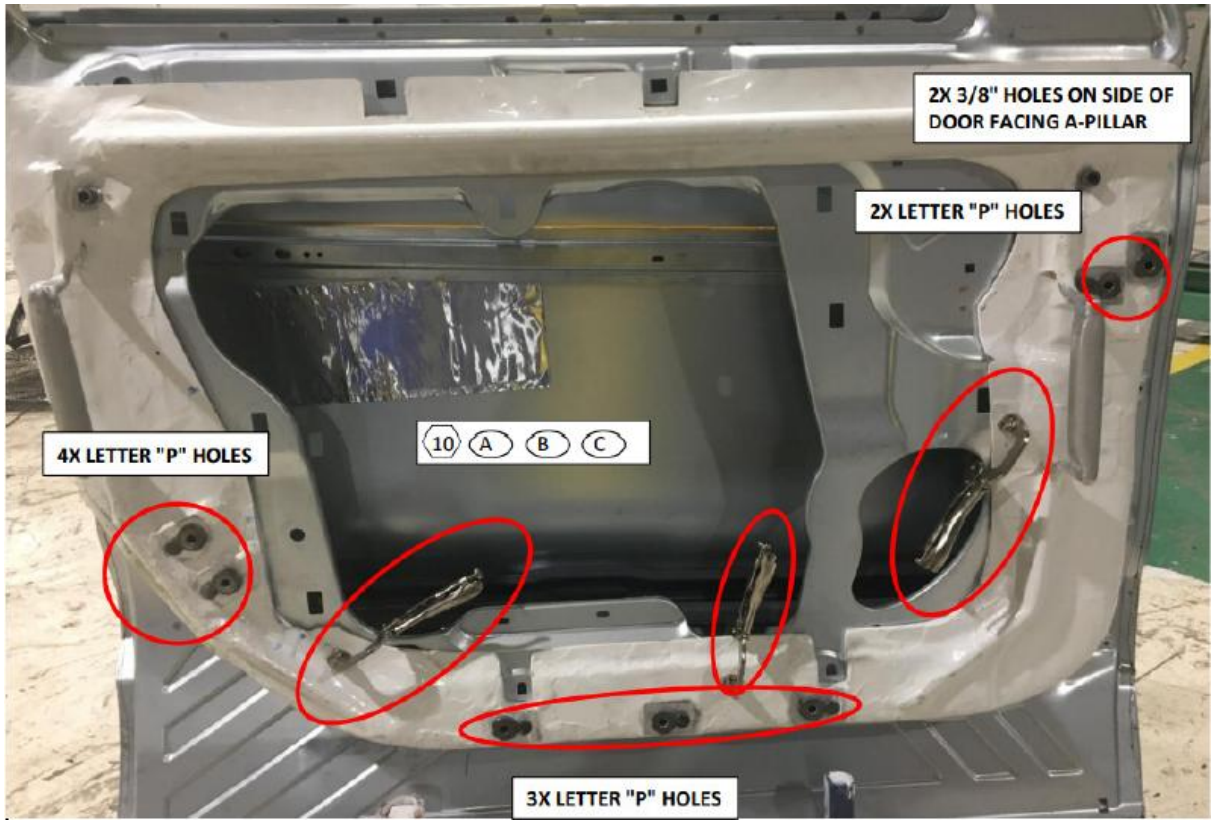
(50) Open up previously drilled 9 holes to the 10mm using modified step drill.

(60) Deburr and apply PM13 ruts preventative to all holes. (Not shown)

(70) Remove & retain lower water drain caps. Blow out metal chips using air gun.

(80) Replace lower water drain caps.

(90) If vehicle has RH ballistic option, repeat process using the RH side drill Fixture FA-U625-070.



PANEL PREPARATION:

Tools Required:

A. T40 TORX SOCKET 1/4"
B. 1/4" DRIVE RATCHET
C. 10MM RATCHETING WRENCH
D. BOSCH TORQUE GUN SET AT 25 NM
E. CLICK TYPE TORQUE WRENCH SET AT 22.5 NM
F. 10MM CROWFOOT

LEGEND:

INSPECT

ITEM

TORQUE

CRITICAL PROCESS

OPERATION

TOOLS

LEVEL 3 PROTECTION PANEL

(10) Install front bracket LB5B-78205A07-AC by inserting it in the door from the low to high, behind the metal window track and fastening with 4X TORX head bolts W715952-S437. hand tighten only.

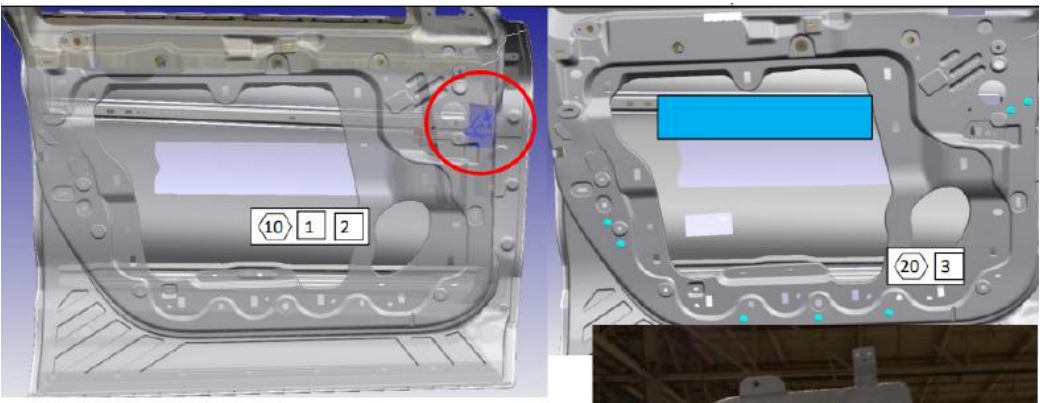
(20) Install mastic pad in location shown. Mastic is shown as blue rectangle.

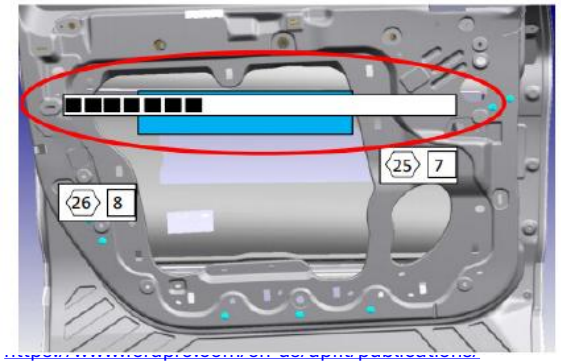
(25) Install foam strip over the mastic pad and along the length of the metal beam inside of the door. Foam strip shown as white rectangle.

(26) Ford level 3 steel panel only, add 7 foam squares in the location shown.

(30) Insert panel into door by leading with the front top corner, pushing down, and rotating the panel into position behind the window track.

(35) If vehicle has RH ballistic option, repeat process on RH door using LB5B-78205A06-AC and LB5B-78202W20-BD.





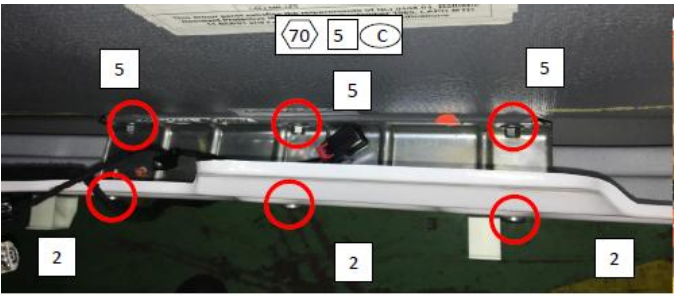
(40) Install rear backet LB5B-78205A09-AC into door using 4X Bolts W715952-S437 and doubler plate LB5B-7820244-AB.

(50) Install bolt W713226-S450 through rear tab into rear bracket. Hand tight only.

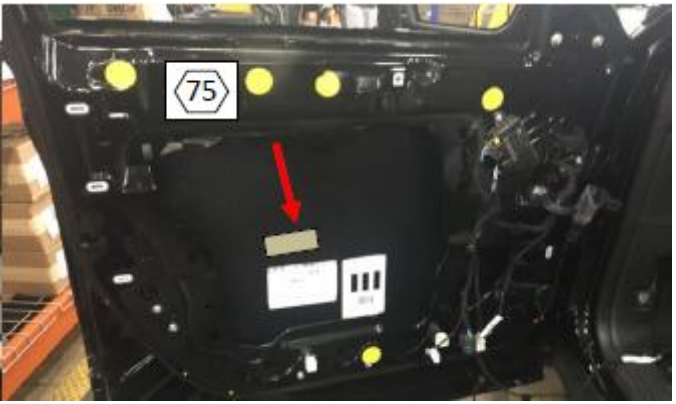
PANEL PREPARATION – LEVEL 3 PROTECTION PANEL *(Cont'd)*

(60) Insert bottom bracket LB5B-78202W37-AC into door and lift up front of panel to place the bracket in position. Install the door-to-bracket bolts W715952-S437.

(70) Lift up on front of panel and install bolt W713226-S450 through lower ballistic tab into lower bracket. Note: it is only necessary to install the most forward of these bolts at this time.

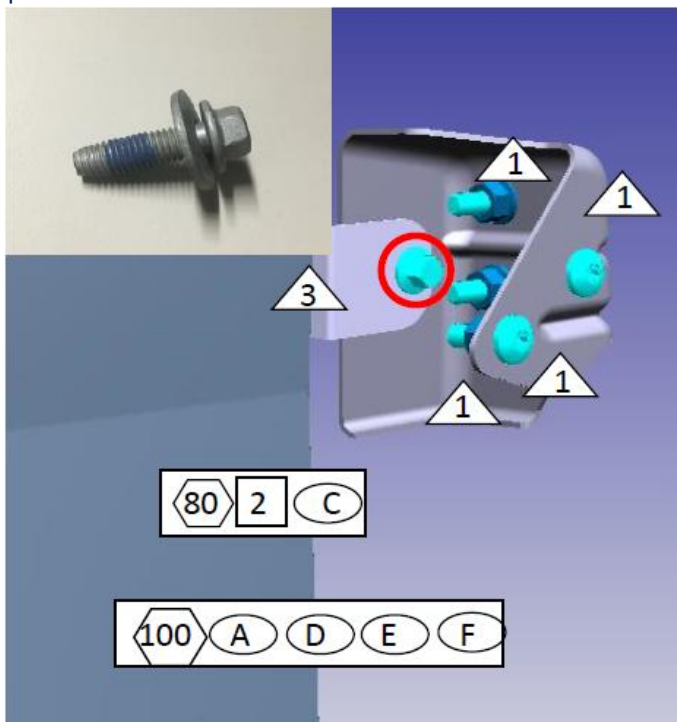


(75) Scan RFID tag on ballistic panel to verify correct installation and traceability.

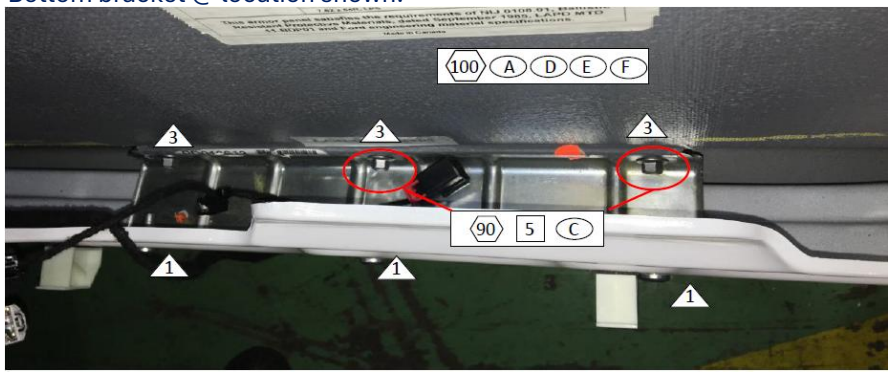


(80) If vehicle has rh ballistic option, repeat process on rh door using LB5B-78205A08-AC and LB5B-78202W36-AC.

(80) Install bolt W714656-S439 into front bracket. NOTE: This bolt is different than the others. It is the only one that has a blue Loctite. The view shown is of a bracket and panel without the door.

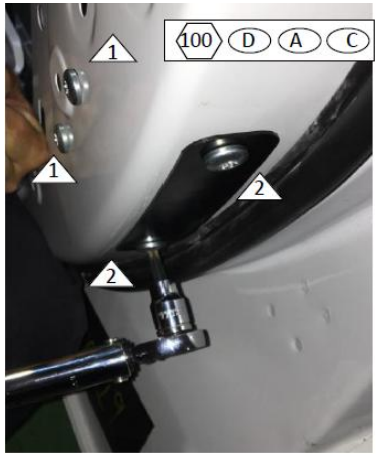


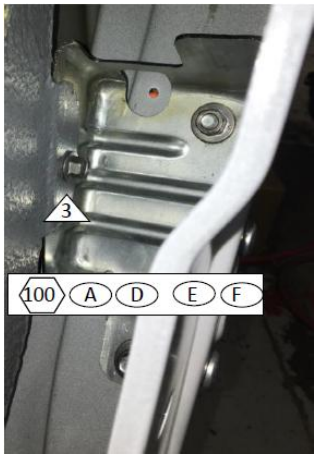
(90) install the remaining (2) bolts w713226-s450 into Bottom bracket @ location shown.



(100) use BOSCH angle gun to torque all TORX head Bolts to 25 nm. Use click type wrench to tighten all Hex head bolts to 22.5 nm . specific torque specs as Follows:
Bottom bracket: 25 +/- 3.8 nm.
Front bracket: 25 +/- 3.8 nm.
Rear bracket with doubler plate: 20 +/- 3 nm.
Rear bracket without doubler plate: 25 +/-3.8 nm.
Armor to bracket: 22.5 +/- 3.4 nm.

(110) note: verify window track has not moved. If the Front welded in window track was bent during Installation of the ballistic kit, bend it back to its Original position at this time. If the window track is Out of place, the window may pop out during door Slam.





LEVEL 4 PROTECTION PANEL:

Tools Required:

A. T40 TORX SOCKET 1/4"
B. 1/4" DRIVE RATCHET
C. 10MM RATCHETING WRENCH
D. BOSCH TORQUE GUN SET AT 25 NM
E. CLICK TYPE TORQUE WRENCH SET AT 22.5 NM
F. 10MM CROWFOOT

LEGEND:

INSPECT

ITEM

TORQUE

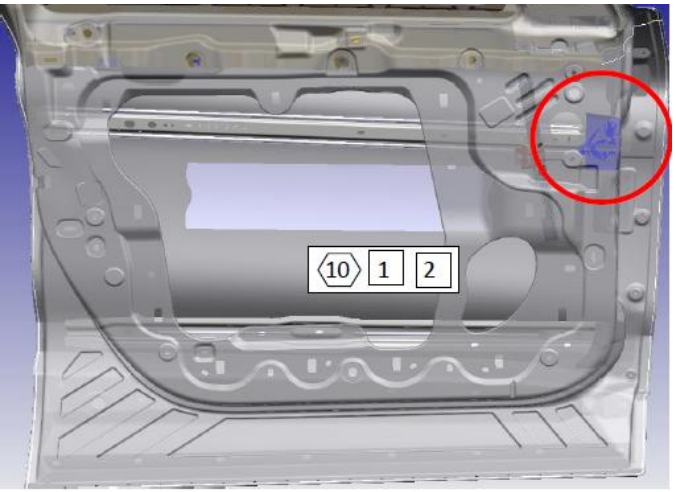
CRITICAL PROCESS

OPERATION

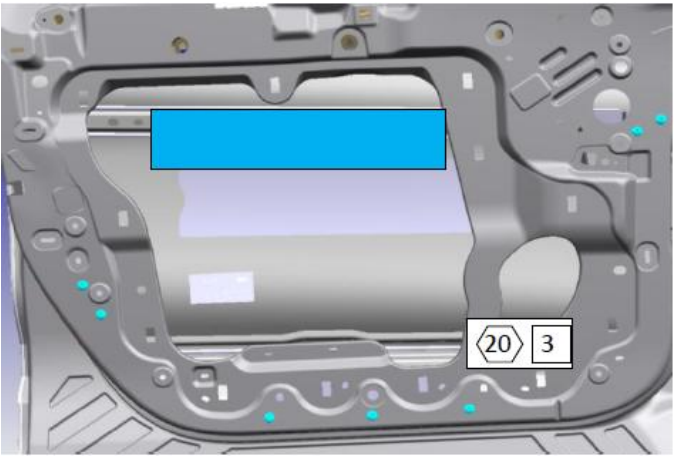
TOOLS

LEVEL 4 PROTECTION PANEL

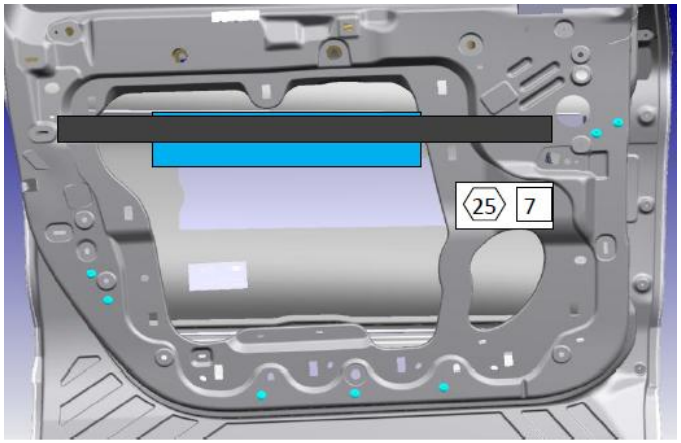
(10) Install front bracket LB5B-78205A07-AC by inserting it in the door from low to high, behind the metal window track and fastening with 4X TORX head bolts W715952-S347. hand tighten only.



(20) Install mastic pad DS73-F20356-AA in location shown. mastic is shown as blue rectangle.



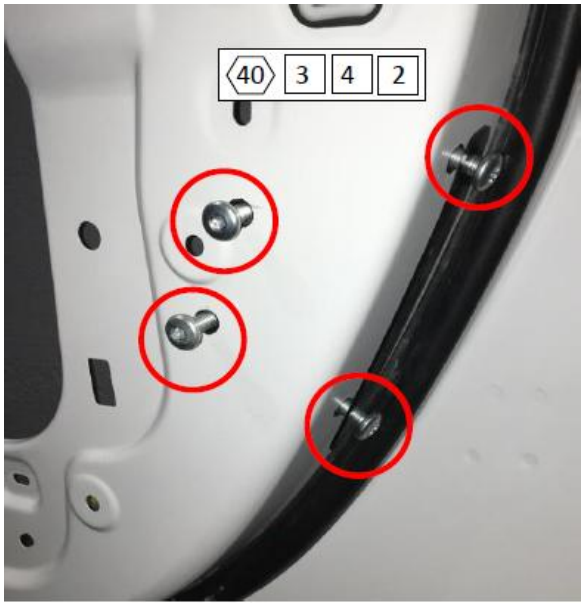
(25) Install foam strip lb5b-1370-aa over the mastic pad And along the length of the metal beam inside of the Door. Foam strip shown as black rectangle.



(30) Insert LH panel lb5b-78202w21-bd into door by Leading with the front top corner, pushing down, and Rotating the panel into position behind the window track.

(35) If vehicle has rh ballistic option, repeat process On rh door using LB5B-78205A06-AC and LB5B-78202W20-BD.

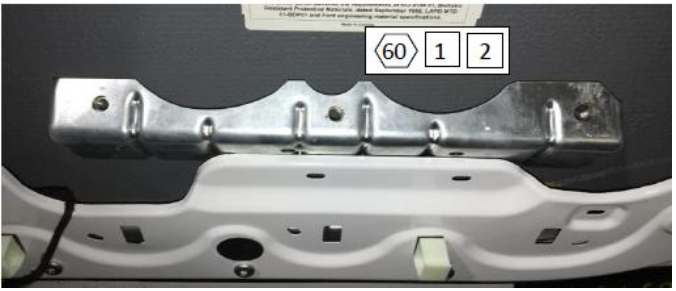
(40) Install rear bracket LB5B-78205A09-AC into door using 4X bolts W715952-S437 and doubler plate LB5B-7820244-AB.



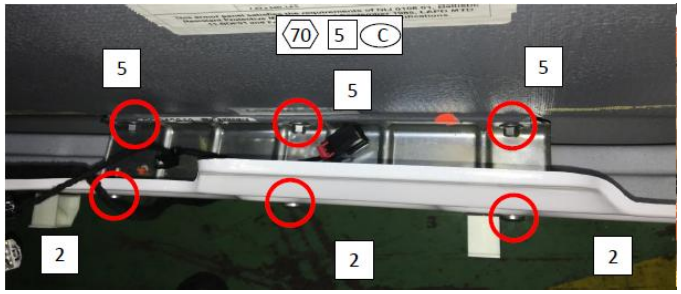
PANEL PREPARATION – LEVEL 4 PROTECTION PANEL *(Cont'd)*

(50) Install bolt W713226-S450 through rear tab into Rear bracket. Hand tight only.

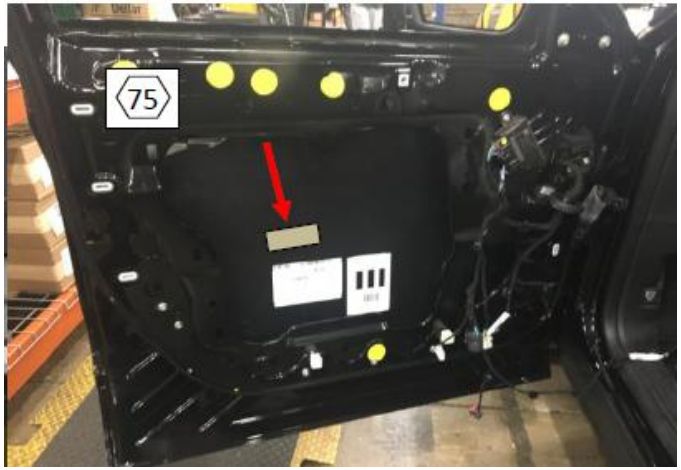
(60) Insert bottom bracket LB5B-78202W37-AC into door And lift up front of panel to place the bracket in Position. Install the door-to-bracket bolts W715952-S437



(70) Lift up on front of panel and install bolt W713226-S450 through lower ballistic tab into lower bracket. Note: it is only necessary to install the most forward of these bolts at this time.

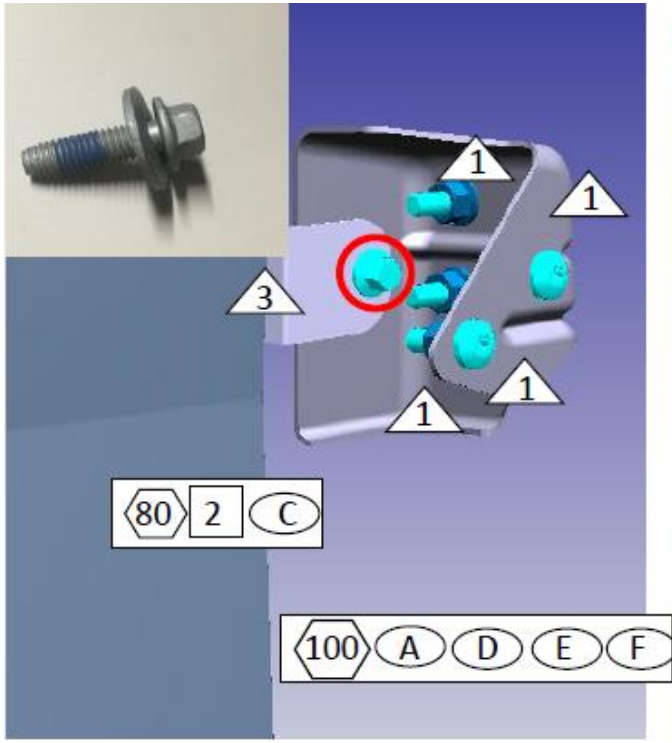


(75) Scan RFID tag on ballistic panel to verify correct Installation and traceability.



(80) If vehicle has rh ballistic option, repeat process On RH door using LB5B-78205A08-AC and LB5B-78202W36-AC.

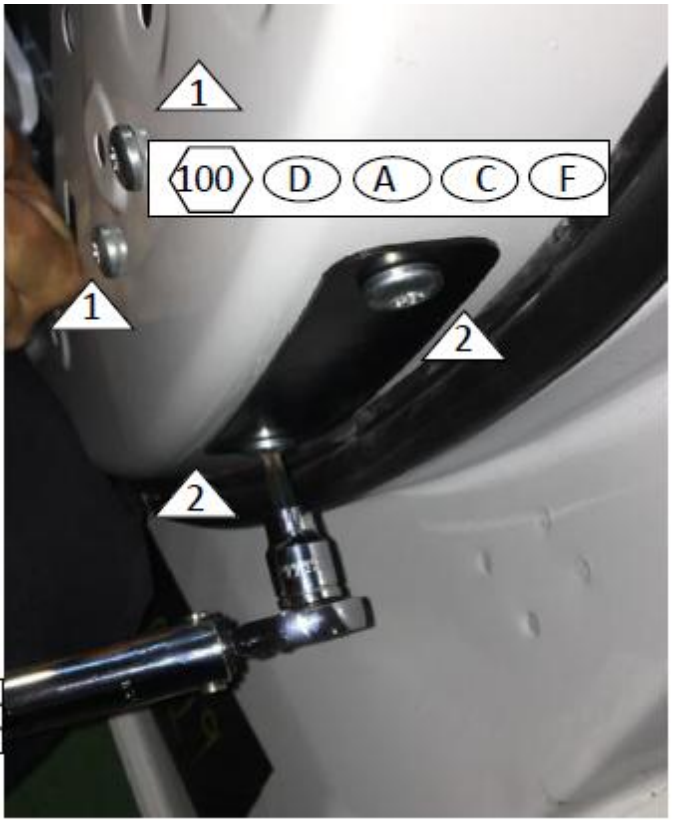
(80) Install bolt W714656-S439 into front bracket. NOTE: this bolt is different than the others. It is the only one that has blue Loctite. The view is shown is of a bracket and panel without the door.

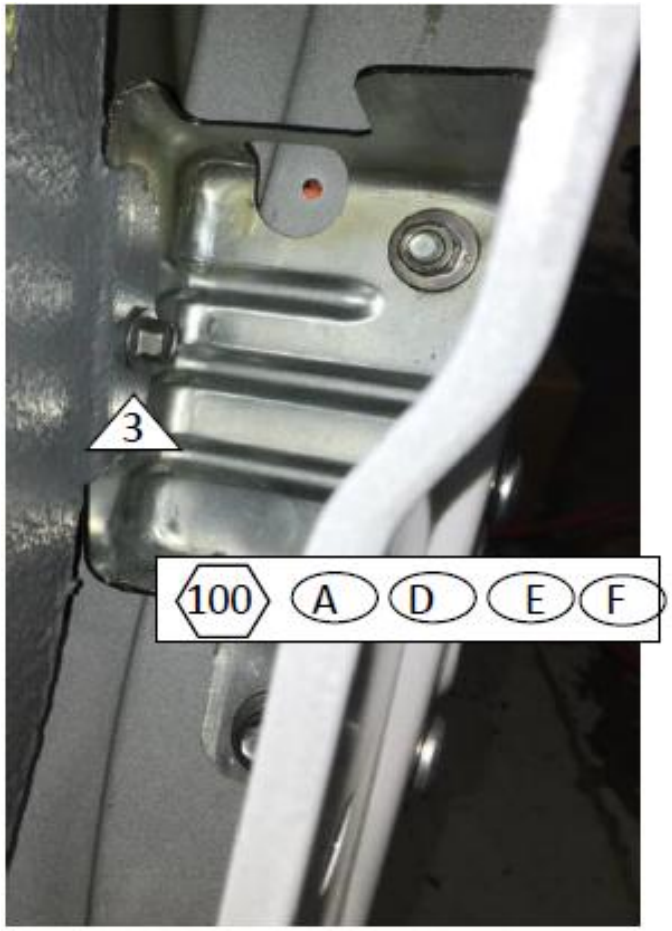


(90) Install the remaining (2) bolts W713226-S450 into bottom bracket @ location shown.

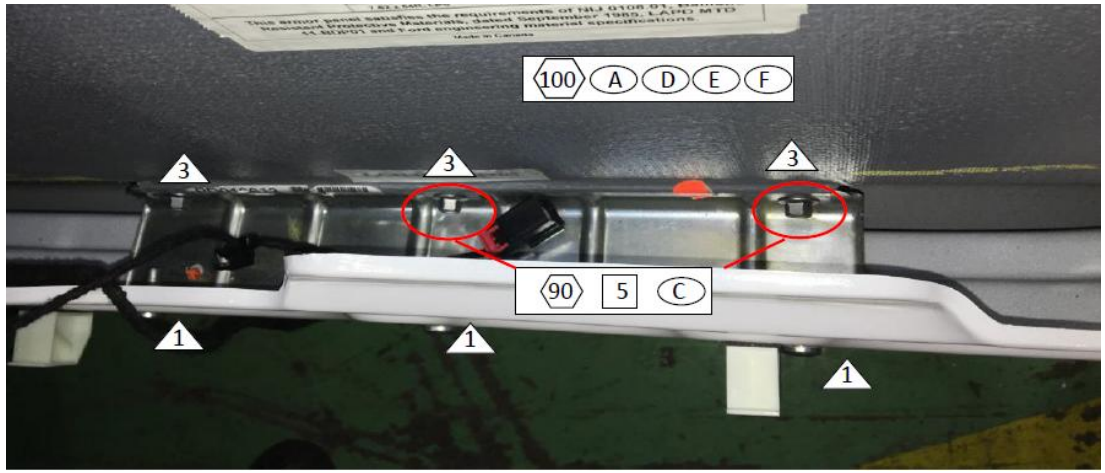
PANEL PREPARATION – LEVEL 4 PROTECTION PANEL *(Cont'd)*

(100) Use BOSCH angle gun to torque all TORX head bolts to 25 nm. Use click type wrench to tighten all hex head bolts to 22.5 Nm.
Specific torque specs as follows:
- Bottom Bracket: 25 +/- 3.8 NM.
- Front Bracket: 25 +/- 3.8 NM.
- Rear Bracket With Doubler Plate: 20 +/- 3 NM.
- Rear Bracket Without Doubler Plate: 25 +/-3.8 NM.
- Armor To Bracket: 22.5 +/- 3.4 NM.





(110) NOTE: Verify window track has not moved. If the front welded in window track was bent during installation of the ballistic kit, bend it back to its original position at this time. If the window track is out of place, the window may pop out during door slam.



DOOR REASSEMBLY:

Tools Required:

A. 1/4" 7MM SOCKET
B. 1/4" DRIVE HEX ADAPTOR
C. 1/4" 10MM SOCKET
D. CLICK TYPE TORQUE WRENCH
E. 1/4" T30 SOCKET
F. 1/4" T25 SOCKET
G. 1/4" T27 SOCKET
H. BOSCH TORQUE GUN SET TO 8 NM
I. 5MM NUT DRIVER
J. 1/4" T20 SOCKET
K. K BOSCH TORQUE GUN SET TO 1.3 NM
L. L 1/2" NUT DRIVER
M. BOSCH TORQUE GUN SET TO 5.4 NM
N. BOSCH TORQUE GUN SET TO 0.9 NM
O. U625-205 RH BALLISTIC PNL LABEL LOCATION FIXTURE
P. U625-200 LH BALLISTIC PNL LABEL LOCATION FIXTURE
Q. VOW FIT TOOL 330 Q
R. LIFT BAR

LEGEND:

INSPECT

ITEM

TORQUE

CRITICAL PROCESS

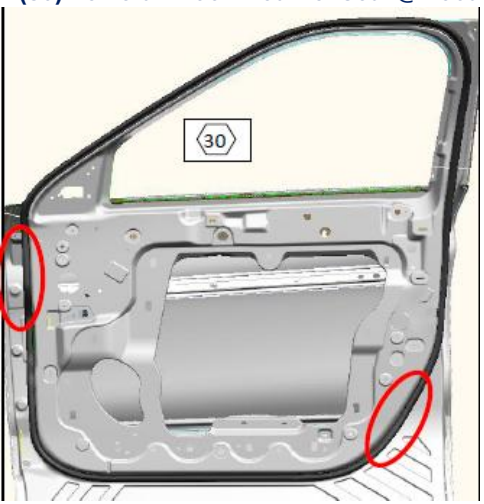
OPERATION

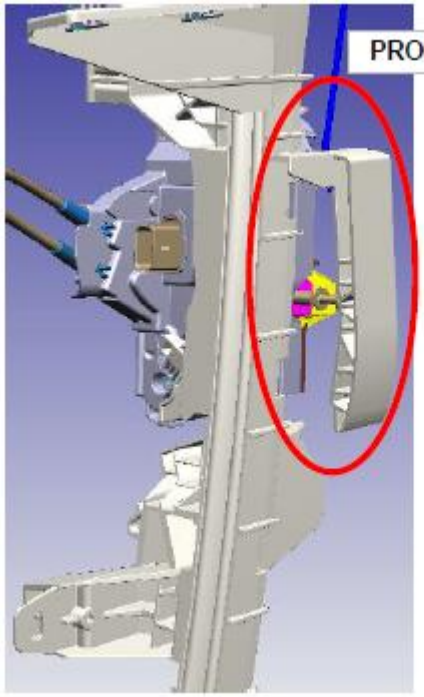
TOOLS

DOOR REASSEMBLY

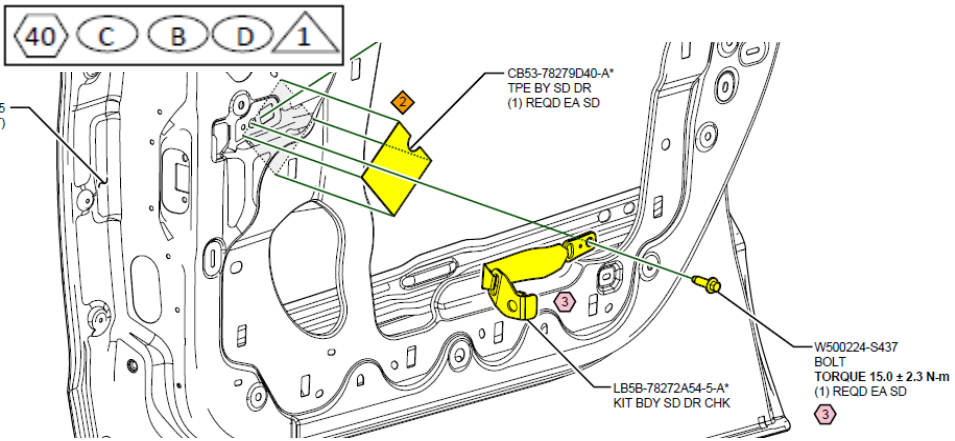
(10) Reinstall front wire harness through clearance hole and properly seat grommet (not pictured)

(30) Reinstall Door Weather Seal @ Locations Shown.

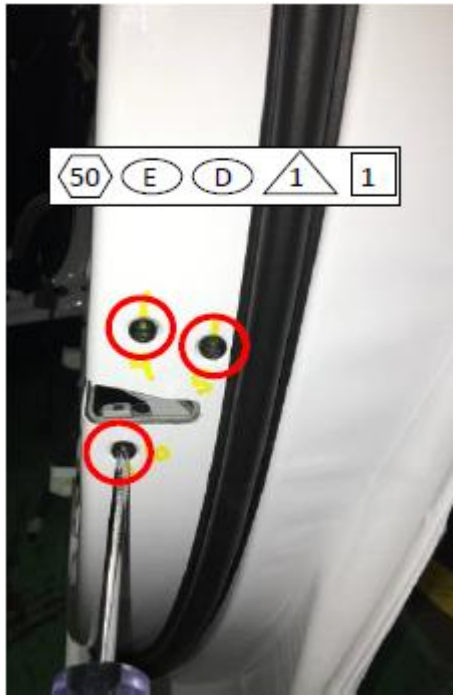




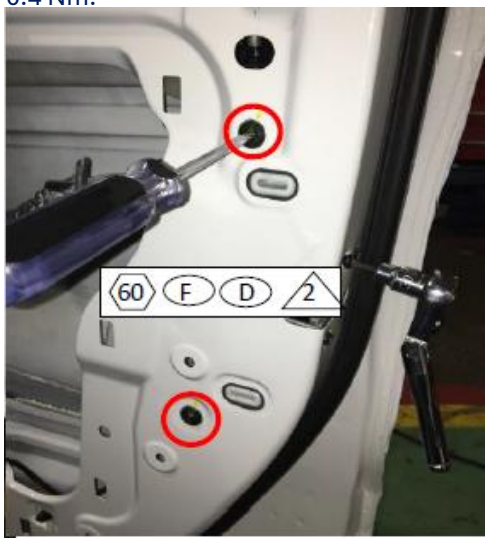
(40) Reinstall check strap bolt & torque to 15+/- 2.3 Nm.



(50) Insert latch assembly into door. Use 3 new bolts w715340-s450b to retain latch and torque to 8+/- 1.2 nm. Note: if door has a ballistic panel installed, break off the pictured "arm" from the latch assembly in order to install the latch.

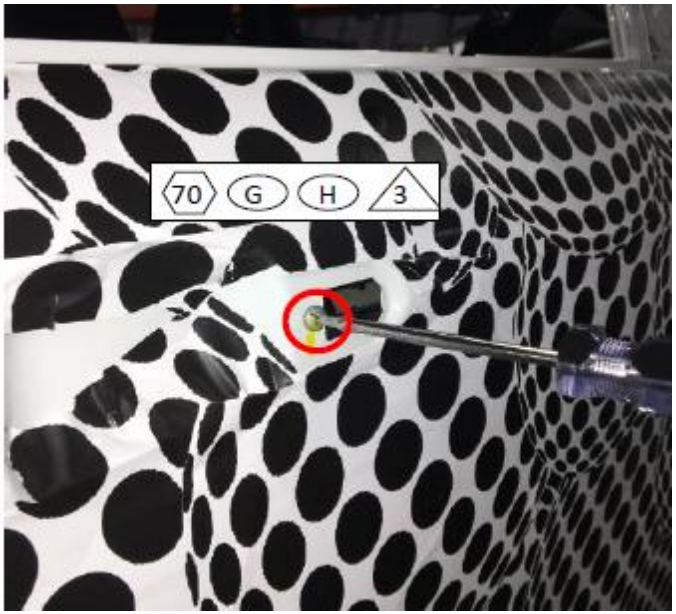


(60) Install 2 OEM window track screws and torque to 2.2+/- 0.4 Nm.



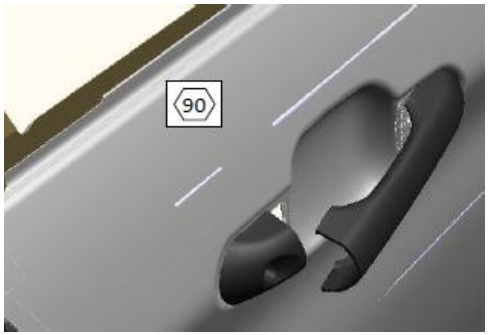
DOOR REASSEMBLY *(Cont'd)*

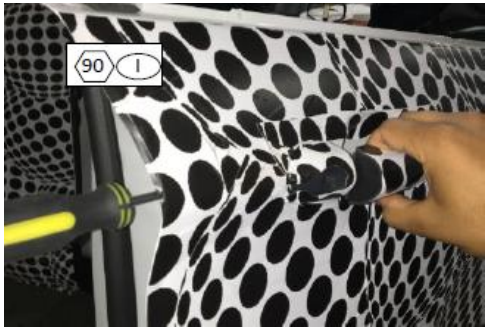
(70) Install OEM handle bolt and torque to 7+/-1.1 Nm.



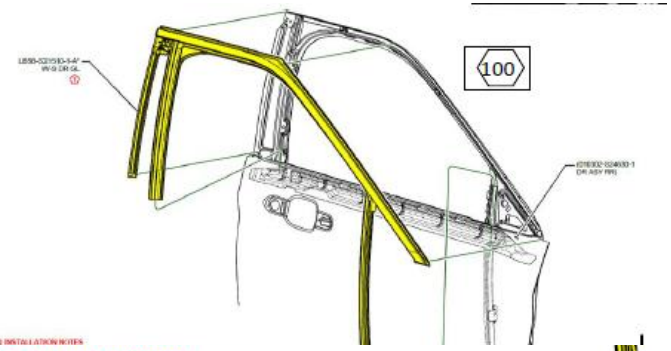
(80) Insert lock bezel into lock cylinder hole.

(90) Insert handle into door, and while applying Gentle pressure, tighten the interior bolt using a 5mm Nut driver. Torque to 4.1 +/- 0.7 nm.





(100) Install outer window trim and insert rubber Window tracks into door.



INSTALLATION NOTES

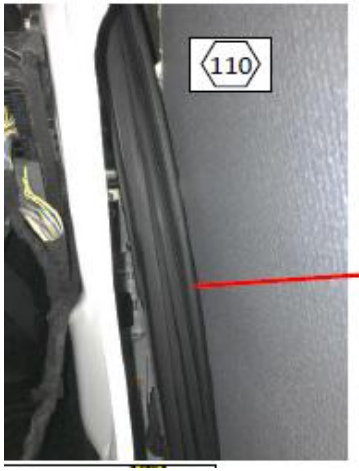
1. REMOVE PART FROM CONTAINER, CARRYING WITH TWO HANDS AT HEADER. DO NOT BEND TWIST HEADER
2. LOWER A-PILLAR EXTRUSION INTO DOOR BELT LINE OPENING
3. AT UPPER B-PILLAR, HOLD RUBBER FLAP UP AND SLIDE LOCATOR TAB INTO SLOT.
4. INSTALL ENTIRE HEADER ONTO DOOR FLANGE.
5. COMPLETE INSTALLATION OF A-PILLAR EXTRUSION.

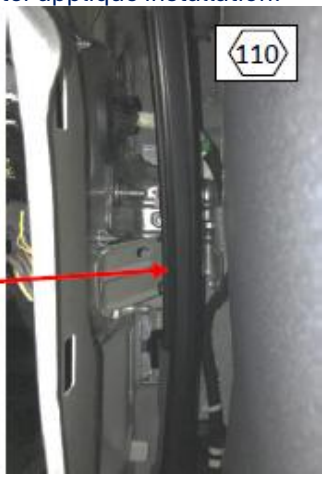
B-PILLAR EXTRUSIONS TO BE INSTALLED AFTER APPLIQUE INSTALLATION.

011119 ✱ FOR LATEST PREFIX, SUFFIX, AND TORQUE SPECIFICATIONS SEE APPROPRIATE "WERS" SCREEN

(110) Reach through the window regulator hole and Seat window track onto the metal rail.
OEM installation notes (pictured left)

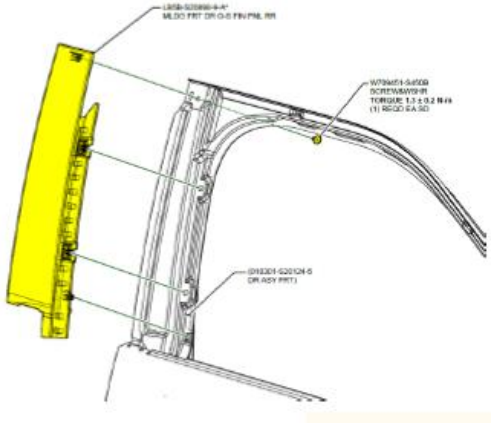
1. Remove part from container, carrying with two hands at header. Do not bend twist header
2. Lower a-pillar extrusion into door belt line opening
3. At upper b-pillar, hold rubber flap up and slide. Locator tab into slot.
4. Install entire header onto door flange.
5. Complete installation of a-pillar extrusion. B-pillar extrusions to be installed after applique installation.



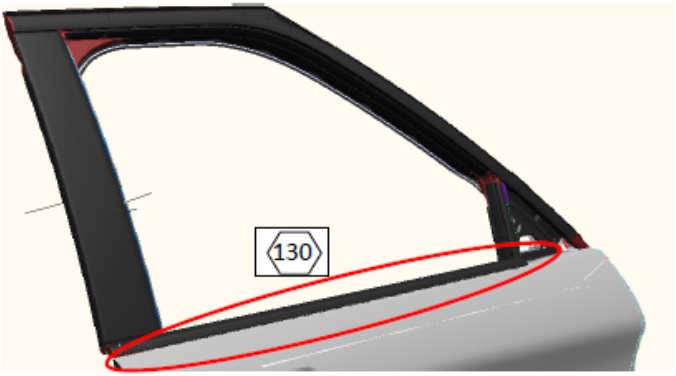


DOOR REASSEMBLY *(Cont'd)*

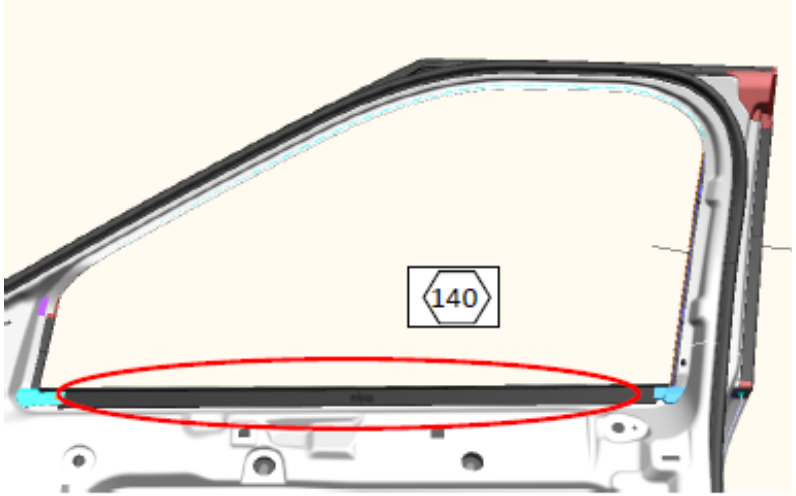
(120) Install outer trim cover by aligning the two pins with the retaining holes and clip into place.



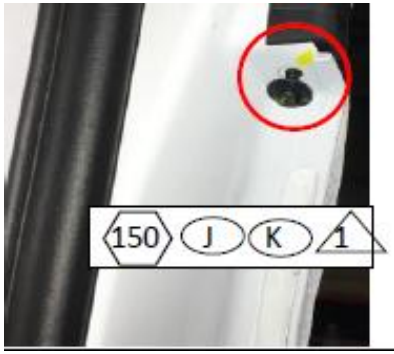
(130) Install outer window bezel as shown.



(140) Install inner window bezel as shown.

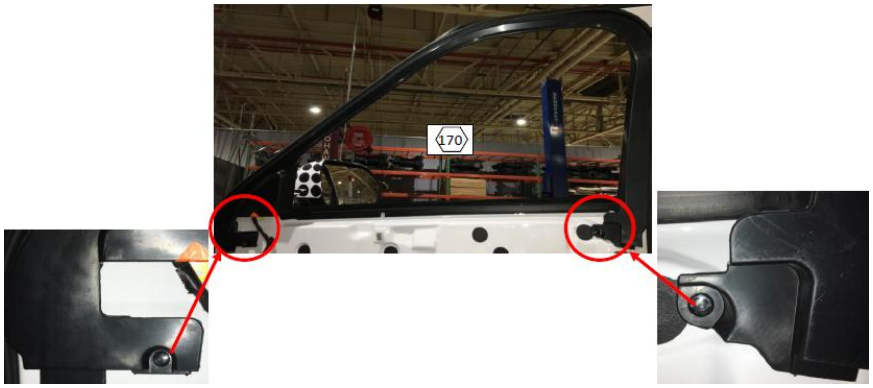


(150) Install OEM bolts into outer trim pieces and Torque to 1.3 +/- 0.2 Nm.

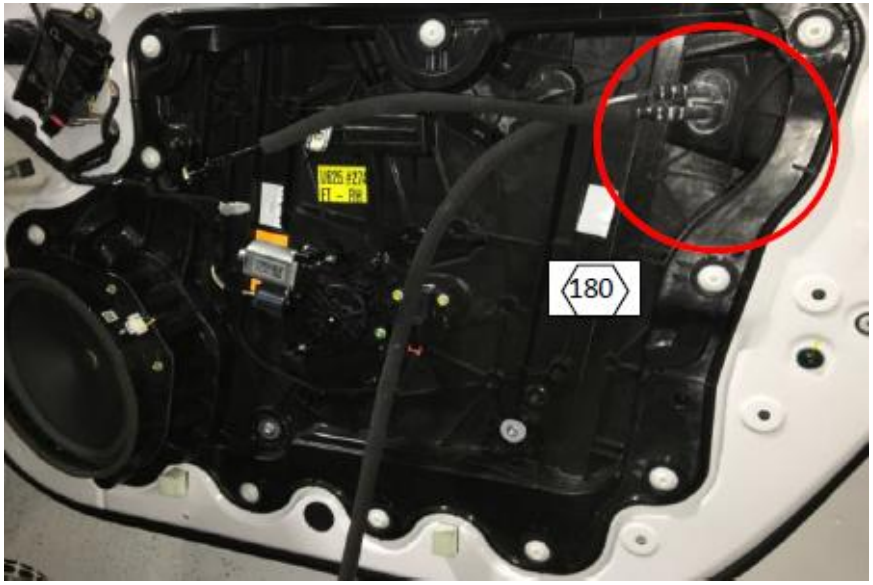


DOOR REASSEMBLY *(Cont'd)*

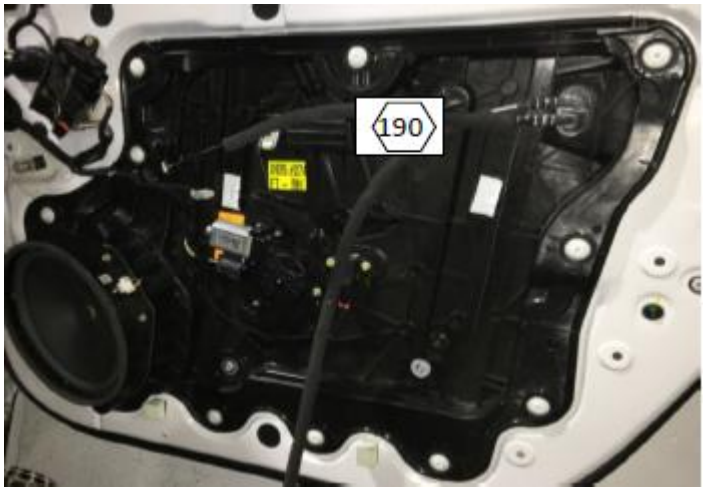
(170) Install inner window trim and use 2 OEM pins to clip it to door. To ensure this piece is properly seated, it is easiest to install from the exterior side of the door.

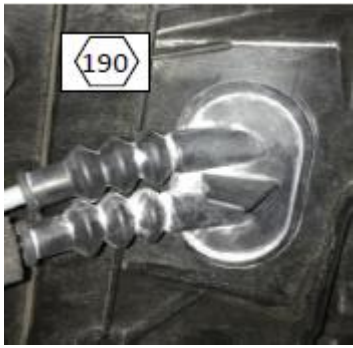


(180) Retrieve window regulator and route handle and lock cable through clearance hole. (Not Pictured)



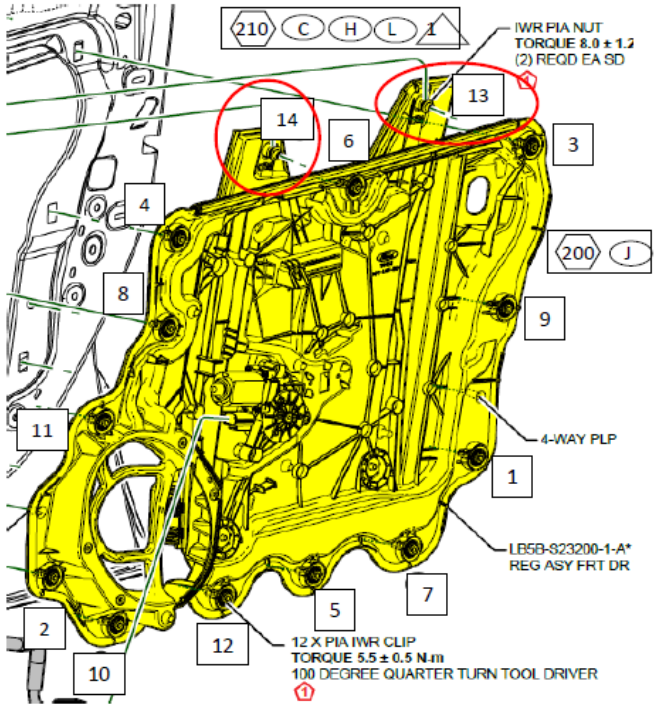
(190) Install window regulator panel onto door. Seat cable grommet into hole.





(200) Once the panel is in place, push the 11 plastic clips in to ensure they are seated, and turn a quarter turn to the right (clockwise) to lock them in the door. The sequence is shown in the diagram to the left.

(210) Tighten the two nuts at the top of the panel and torque to 8+/-1.2 Nm. On the diagram to the left these nuts are number 13 and 14.

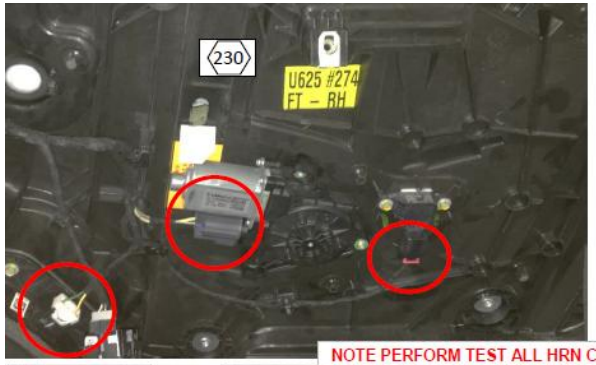


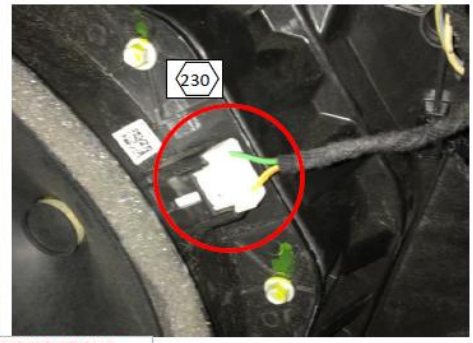
DOOR REASSEMBLY *(Cont'd)*

(220) Retrieve and install window into door. Ensure it is in the window tracks and push down on window to lock window into regulator. You may have to plug the window switch in and raise the window to clip it
Into place.

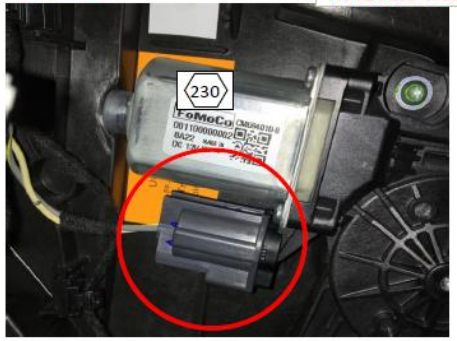
(225) Retrieve window switch bezel and plug into harness. Verify that window goes all the way up and all the way down. (Not pictured). After function check, unplug window switch bezel and set aside.

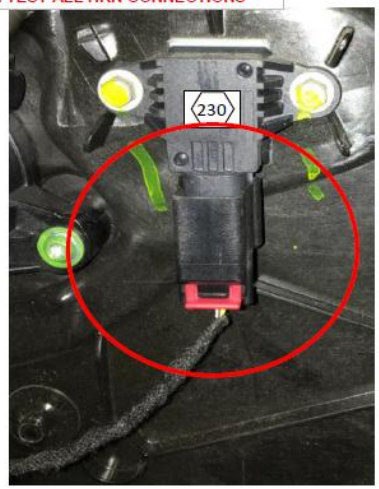
(230) Reinstall 4 OEM clips that are on OEM wire harness to the window regulator panel and reconnect previously disconnected speaker harness, window motor harness, and sensor harness. Note: perform click-push-click test on all harness connectors.





NOTE PERFORM TEST ALL HRN CONNECTIONS

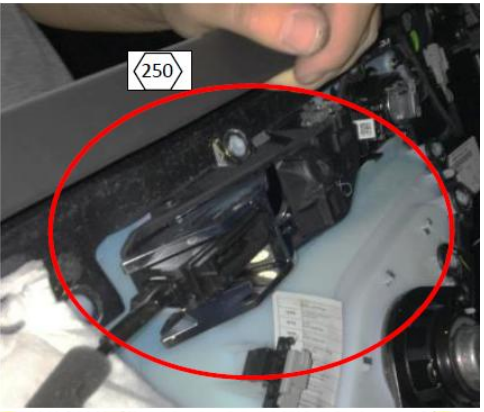


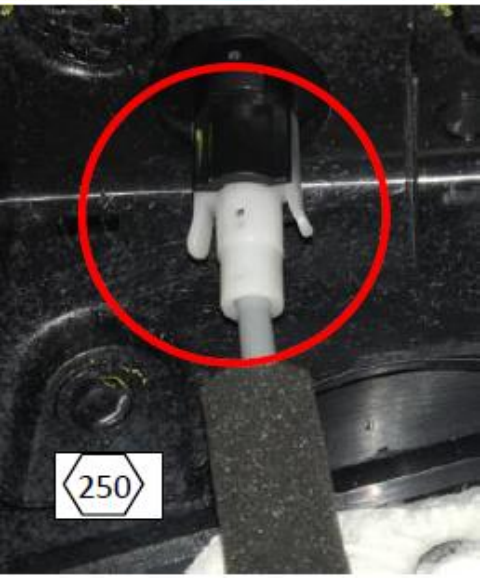


DOOR REASSEMBLY *(Cont'd)*

(240) Retrieve door interior trim panel (not pictured).

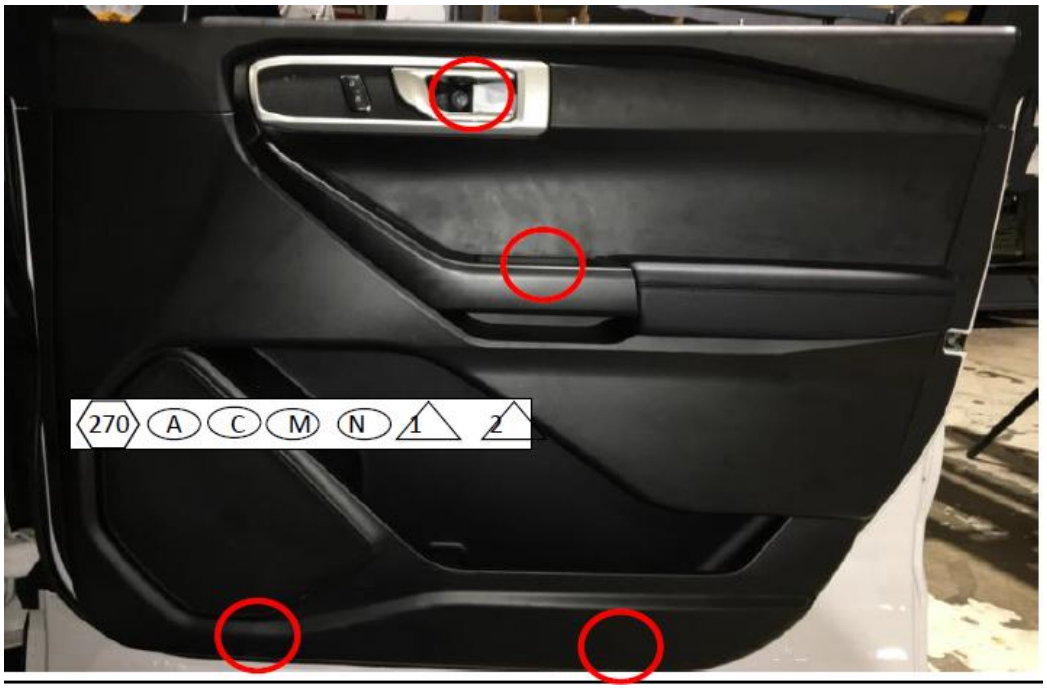
(250) Reconnect electrical harness, door handle cable, and lock soldier cable. Note: lock solder cable is routed underneath handle cable. Perform "Click-Push Click " harness test.





(260) Install panel starting at the top and working down and around to ensure the panel clips into the door.

(270) Reinstall previously removed 4 OEM fasteners behind the handle, under the window switch bezel, and bottom of the door as follows. Reinstall OEM fastener behind door handle and torque to 5.4+/- 0.9 nm. Reinstall OEM fastener under window bezel and torque to 5.4 +/- 0.9 nm. Reinstall two OEM fasteners at the bottom of the door and torque to 0.9+/-0.2 Nm.



(290) Retrieve reinstall OEM handle closeout panel window switch bezel, reconnect wire harness. Note: perform "click-push-click HRN test. Reinstall bezel into door.

(300) Install ballistic panel label on door panel using rh fixture fa-u625-205 after dressing area with alcohol & a clean towel (not pictured)
310) repeat assembly procedures for the LH door. (Not shown)

POLICE MODIFIER GUIDE

SECTION 6 - CHANGE CONTROL

- 20250428 – Updates
  - PAITRO & HORN Circuit Information on pages 27, 30, 31, 44, 46, 47, 48, and 50.
  - Method 1 and Method 2 infomration on pages 42 and 43 for Driver Door Ajar.
- 20250221 – Reformatted PMG Structure
- 20250210 – Published